

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Modernizing the FCC Form 477 Data Program) WC Docket No. 11-10
)

FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: August 3, 2017

Released: August 4, 2017

Comment Date: [30 days after publication in the Federal Register]

Reply Comment Date: [45 days after publication in the Federal Register]

By the Commission: Chairman Pai and Commissioners Clyburn and O’Rielly issuing separate statements.

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I. INTRODUCTION

1. Today, we initiate a further proceeding to take a focused look at the Commission’s Form 477—the principal tool used by the Commission to gather data on communications services, including broadband services, to help inform our policymaking. Our goal in this Further Notice of Proposed Rulemaking is two-pronged: to examine our experience based on our current data collection in order to

collect better and more accurate information on Form 477; and, to explore how we can revise other aspects of the data collection to increase its usefulness to the Commission, Congress, the industry, and the public. These steps continue the Commission's efforts to improve the value of the data we continue to collect, while also identifying and eliminating unnecessary or overly burdensome filing requirements.

II. BACKGROUND

2. The Form 477 is a semi-annual, mandatory collection of data from all providers of local exchange telephone service and interconnected Voice over Internet Protocol (interconnected VoIP) that have end-user customers, and from all facilities-based providers of mobile broadband and mobile telephone service as well as facilities-based providers of fixed broadband connections to end-user premises.¹ The Form collects subscription data from all of these filers and deployment data from all facilities-based filers of broadband and mobile voice service.²

3. Currently, providers of fixed (wired or fixed wireless) voice service (including both local exchange service and interconnected VoIP) and fixed broadband service report on their subscriptions by submitting their total connections in each census tract in which they provide service.³ In addition, the providers of fixed voice service answer certain questions about their state-level total subscriptions.⁴ Providers of mobile voice and broadband report their total subscribers for each state in which they provide service to customers.⁵

4. In order to report on the deployment of their services, facilities-based, fixed broadband service providers identify the census blocks in which they currently—or could, within a standard service interval—provide service, along with data specifying the last-mile transmission technology, maximum download/upload speed of service packages offered over that technology in that census block, and specifying whether the service is available for consumers or for business/enterprise/government customers.⁶ Facilities-based providers of mobile broadband service report on deployment by submitting, for each technology and frequency band employed, polygons in shapefiles that digitally represent the geographic areas in which a customer could expect to receive the minimum speed the provider advertises for that area.⁷ In addition, these providers report the census tracts in which their service is advertised and available to potential customers.⁸ Facilities-based mobile voice providers report polygons depicting geographic coverage of each technology and frequency band they employ.⁹

5. In establishing Form 477 in 2000, the Commission envisioned that the data collected would help it better assess the availability of broadband services, such as high-speed Internet access service, and the development of competition for local telephone service, materially improving its

¹ See generally, FCC, FCC Form 477 Local Telephone Competition and Broadband Reporting Instructions (Dec. 5, 2016), Section 2, “Who Must File This Form?” at 5-8 (Dec. 5, 2016), <https://transition.fcc.gov/form477/477inst.pdf> (*Form 477 Instructions*).

² *Id.*, Section 2.5, “Form Sections to Be Completed by Each Type of Provider” at 9.

³ *Id.*, Section 5.5, “Fixed Voice Subscription (Tract Data)” at 19; Section 5.4, “Fixed Broadband Subscription at 18.

⁴ *Id.*, Section 5.6, “Local Exchange Telephone Subscriptions (State Data)” at 20-22; Section 5.7, “Interconnected VoIP Subscription (State Data)” at 22-23.

⁵ *Id.*, Section 5.10, “Mobile Voice Subscription” at 26-27; Section 5.9, “Mobile Broadband Subscription” at 25-26.

⁶ *Id.*, Section 5.3, “Fixed Broadband Deployment” at 17-18.

⁷ *Id.*, Section 5.8, “Mobile Broadband Deployment” at 24.

⁸ *Id.*, Section 5.9, “Mobile Broadband Service Availability” at 25.

⁹ *Id.*, Section 5.11, “Mobile Voice Deployment” at 26.

policymaking in those areas.¹⁰ From the outset, the Commission sought to minimize the burden the collection's requirements would impose on filers.¹¹ Accordingly, the Commission limited the collection to easily-quantifiable and readily-available statistics that would reflect the level of service actually provided by incumbents and new entrants.¹² Since 2013, with input from industry, researchers, and other advocates, we have identified elements of the Form 477 data collection that appear to be suitable for revision to collect more accurate and useful data, or elimination because they are unnecessary or overly burdensome. This FNPRM is the initial step in further improving the Form 477 data collection.

III. DISCUSSION

6. Accurate and reliable data on fixed and mobile broadband and voice services are critical to the Commission's ability to meet its goal of decision-making based on sound and rigorous data analysis. Others, including Congressional and state and Tribal policymakers, researchers, and consumers, also rely on the data we collect for a variety of purposes. In support of these efforts, we seek comment first on ways in which the Commission might change aspects of the Form 477 to increase the quality and accuracy of the information we will continue to collect. We also seek comment on ways in which the Commission might streamline its current Form 477 requirements and thereby reduce the burdens on filers. We begin below with our proposals for improving and streamlining the Form 477 data collection for mobile services, before turning to our discussion of fixed services.

7. In undertaking this examination of the Form 477 data collection, one of our primary objectives is to ensure that the data we collect are closely aligned with the uses to which they will be put, both by the Commission and by outside stakeholders. As a preliminary issue, we seek comment on those uses to inform our analysis as we proceed.¹³ For each of the issues considered below, we ask for comment on the relationship between potential changes to the collection and the current or expected need for, and use of, the data. Specifically, we ask for comment on whether and how revisions to the collection would better support an existing or expected use of data. In addition to the Commission's many uses for the data, we understand that external stakeholder uses of the data include state public utility commission regulatory and program analysis, academic research, and state and local broadband deployment and adoption analysis. Are there other external uses of the data for which we should account if we make changes to the collection? Is the existing data collection well designed for Commission and stakeholder use? Will the revisions under consideration in the FNPRM better align the data we collect with the use of those data? Are there elements of the collection not discussed below that we should consider for elimination because of redundancy or insufficient usefulness?

A. Mobile Services

1. Mobile Broadband Deployment

8. Having accurate and reliable mobile broadband deployment data is critical to policymakers as well as to consumers. However, obtaining meaningful data in the mobile context is challenging. A user's mobile service experience is inherently variable and is affected by various factors, such as terrain, location (e.g., whether the user is indoors or outdoors or distance from a tower), weather, congestion, and the type of connected device.¹⁴ In this Further Notice, we seek comment on the tradeoffs

¹⁰ *Local Competition and Broadband Reporting*, Report and Order, 15 FCC Rcd 7717, at 7718, 7719, paras. 1, 3 (2000) (2000 *Local Competition and Broadband Reporting Order*).

¹¹ *Id.* at 7721, para. 6.

¹² *Id.*

¹³ See Letter from Steve Morris, Vice President & Associate General Counsel, NCTA, The Internet & Television Association, to Marlene H. Dortch, Secretary, FCC, WC Docket 11-10, at 1-2, (filed July 26, 2017).

¹⁴ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, Nineteenth Report, 31 FCC Rcd 10534, 10608-09, para. 104 (2016) (19th *Competition Report*).

among the following possible approaches for improving the mobile broadband deployment data we collect. We also seek input on whether the characteristics or properties of next generation mobile technologies such as 5G may require modifications to the current Form 477 requirements.

9. The current Form 477 data on deployment of mobile broadband services represents a significant improvement over the data that were previously available from earlier data sources. The *2013 Form 477 Order*, which provides the framework for the current collection, required for the first time that facilities-based mobile broadband providers directly submit deployment data, representing nationwide coverage areas, as well as required minimum advertised or expected speeds for those coverage areas.¹⁵ The current data collection is intended to represent where consumers should expect to receive mobile broadband services at the minimum speeds set by the providers in their marketplace, and it was designed to minimize burdens and allow flexibility for providers.¹⁶ Providers, and not the Commission, decide the speeds of service they offer and may choose among different reasonable bases for substantiating their Form 477 filings.¹⁷

10. Our experience in analyzing and working with the Form 477 data has shown us, however, that the Form 477 data could be improved further to better understand the mobile broadband service that consumers actually experience. As noted above, service providers are required to file, and certify the accuracy of, shapefiles representing those areas where, for a specified technology, “users should expect the minimum advertised upload and download data speeds associated with that network technology.”¹⁸ Questions have arisen in various contexts regarding the bases for certain filings and the extent to which those filings reflect actual user experience.¹⁹ The Commission to date has not systematically examined the precise underlying methodologies that are used by service providers in generating their data nor has it investigated whether actual consumer experience has diverged substantially from the Form 477 filings. Moreover, providers’ minimum advertised or expected speeds have, to date, been treated as confidential, limiting the ability of policymakers and consumers to compare offerings among service providers from this data collection. Also, because service providers select their own methodologies for determining the coverage and speeds provided, these methodologies tend to vary among providers. These varying methodologies make it difficult for the Commission to compare coverage areas and minimum reported speeds, as the underlying meanings of what the coverage and speed information depict may differ among service providers. Also, current Form 477 filings typically do not include meaningful information about

¹⁵ Coverage areas are broken down by technology and spectrum band. *Modernizing the FCC Form 477 Data Program*, Report and Order, 28 FCC Rcd 9887, 9908, para. 42 (2013) (*2013 Form 477 Order*). Previously, the Form 477 data collection required providers of “facilities-based mobile wireless broadband service to submit data indicating census tracts in which ‘service is advertised and available to actual and potential subscribers.’” *Id.* at 9909, para. 44. The Commission retained this requirement—though eliminated reporting by speed tiers—to understand if mobile broadband service was “available” to an area. *Id.* at 9909-10, para. 44. Other improvements were also made with the *2013 Form 477 Order*, such as reporting of certain company identification information, which facilitates our transaction reviews and vigilance against waste, fraud, and abuse. *Id.* at 9888, paras. 3-4.

¹⁶ *Id.* at 9888, 9909-10, paras. 3-4, 44-45, & n.138.

¹⁷ *Id.* at 9897, 9908-11, paras. 23 (noting that Commission-predefined speed tiers were eliminated and that the provider-defined advertised speeds and other Form 477 data submitted must be certified as accurate by the provider), 42-50, n.138 (allowing providers to submit their self-defined minimum advertised speed for a coverage boundary, based on spectrum band and technology).

¹⁸ The *2013 Form 477 Order* rejected the collection of actual mobile signal strength, speed, and capacity measurements. *Id.* at 9906-07, 9911, paras. 39, 50.

¹⁹ For example, in the context of the Mobility Fund-II proceeding, various commenters have raised concerns about the accuracy of the Form 477 filings. *See, e.g.*, Competitive Carriers Association Reply, WT Docket No. 10-208, WC Docket No. 10-90, at 6 (filed May 11, 2017); Letter from Caressa D. Bennet, Gen. Counsel, Rural Wireless Assoc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 10-208, WC Docket No. 10-90, at 6-9 (filed Aug. 23, 2016).

the methodologies by which service providers are generating their coverage contours.

11. *Enhancing Our Current Data Collection.* We seek comment on the most appropriate way to retain the benefits of the current Form 477 data collection while introducing certain improvements. Is there a way by which we can improve our current data collection to better understand and evaluate the actual consumer experience? As part of this approach, we propose that we would make service providers' minimum advertised or expected speeds publicly available (as described below in Section III.C.1.a.). Should we require that filers submit their mobile deployment files as rasters,²⁰ as well as, or instead of, shapefiles? Would the publication of the minimum advertised speed plus a more meaningful disclosure of the methodologies used by individual service providers allow a better reflection of actual consumer experience, and enhance the ability of policymakers and consumers to compare across service providers?

12. *Standardized Predictive Propagation Model.* In addition, we seek comment on requiring the submission of standardized propagation models for 4G LTE and later-generational technologies. Should the Commission require filers to use predictive propagation models to prepare their Form 477 deployment filings? If so, we seek comment on the extent to which we should take additional steps to specify possible eligible models for this purpose, and to standardize to some extent the output of those models as well as certain input parameters, with the goal of allowing more meaningful comparisons among service providers' mobile broadband deployment. For instance, should the Commission require that deployment shapefiles represent coverage at median speeds as well as speeds at the cell edge? If so, how should the Commission decide the specified speeds? Or, for instance, the Commission could specify a median download speed of 10 Mbps with an edge speed of 3 Mbps. Would this be appropriate, and if not, why not? Should we also consider setting a cell edge upload speed such as a voice-over-LTE (VoLTE) requirement or an upload speed of 1 Mbps, or would an upload speed lower than 1 Mbps be appropriate, and if so, why?

13. What input parameters would the Commission need to standardize to allow for meaningful comparison among providers' LTE data submissions? As examples, should the Commission standardize, or specify reasonable ranges for, any of the following parameters, and, if so, why: (1) location of cells in decimal latitude and longitude; (2) channel bandwidth in MHz; (3) signal strength; (4) signal quality with signal to noise ratio; (5) cell loading factors; or (6) terrain provided at a minimum resolution of three arc-seconds? What is the minimum set of parameters the Commission would need to standardize to allow for meaningful comparisons among service providers? To what extent should the providers be free to determine their speeds? To what extent would these predictive models provide the most accurate predictions of actual consumer experience? Would submissions of standardized predictive propagation models with prescribed parameters be too burdensome on smaller service providers? If so, how could the Commission ensure it receives standardized submissions from all providers without unduly burdening small service providers?

14. *Supplement Data Collections with On-The-Ground Data.* To better evaluate the actual consumer experience under the approaches above, we also seek comment on whether the Commission should require some "on-the-ground" data as part of any Form 477 data collection. The previously discussed data collections would be based on the coverage and speeds that theoretically should be achieved based on the service provider's decision on its own submitted propagation model, or some other

²⁰ Raster datasets "are commonly used for representing and managing imagery, digital elevation models," or "as a way to represent point, line, and polygon features." ArcGIS Help, *Raster Basics*, <http://desktop.arcgis.com/en/arcmap/10.3/manage-data/geodatabases/raster-basics.htm> (last visited July 31, 2017). Rasters can "represent all geographic information (features, images, and surfaces)," and are "a universal data type for holding imagery in GIS." *Id.* As deployment files are typically developed as rasters originally and then converted to shapefiles, the submission of rasters would appear to be less burdensome for filers than the submission of shapefiles. In addition, unlike shapefiles, rasters would allow the Commission to check the resolution of the submissions and to apply standard parameters, including simplified outputs and smoothing, when converting the rasters to shapefiles for analysis.

reasonable methodology of its choosing, or a propagation model with standardized parameters as specified by the Commission. The collection of on-the-ground data would supplement the model-based data, improving the understanding of how the theoretical data relates to actual consumer experience. For instance, comparing results of theoretical propagation models and actual speed test data from Ookla indicate that propagation model parameters such as signal strength and speed may not be as closely correlated to the theoretical prediction when analyzing actual on-the-ground data in a particular geographic area. To more accurately reflect consumer experience, should some actual speed test data, aggregated up to a certain geographic level, be required? How could the Commission impose such a requirement without being unduly burdensome? Are there data of this kind that service providers already generate during the ordinary course of business which would be less burdensome to collect?

15. *Incorporation of New Mobile Wireless Technologies.* The 2013 Form 477 Order provided for reporting by various existing technologies but did not provide for the reporting of data for new wireless technologies, such as 5G.²¹ Should the Commission require separate reporting of 5G mobile broadband deployment? Are there any aspects of 5G mobile broadband services that would suggest a need to represent deployment on Form 477 differently from 4G LTE and other mobile technologies? For instance, what are the specific use cases for mobile 5G service that the Commission should consider when collecting data to accurately represent 5G services being deployed to consumers? Should the Commission define 5G for the purposes of the Form 477 data collection, and, if so, how? Further, we seek comment on whether and, if so, in what circumstances, should the Form 477 take into account the deployment of facilities used in non-traditional ways in offering wireless services to consumers? For example, while Wi-Fi facilities traditionally have provided consumers with portable, not mobile, wireless connectivity, should the Form 477 track deployment of such facilities when offered to consumers in conjunction with resold mobile service? Might there develop other wireless services based exclusively on the integration of numerous unlicensed facilities, such as Wi-Fi routers, that might warrant tracking in Form 477? If so, under what circumstances, and how should any such facilities deployment be reported?

16. *Mobile Satellite Broadband Service.* Satellite operators today may provide both fixed and mobile broadband service²² in the same spectrum. Considering the small but growing market for satellite mobile broadband, would it be appropriate to make additional modifications to Form 477 to include satellite broadband data in the mobile broadband data collection, and, if so, how?²³

2. Streamlining Mobile Deployment and Service Availability Data

17. The 2013 Form 477 Order, while modernizing the data collection generally, also ensured that, for the first time, the Form 477 data collection would require the submission of mobile broadband deployment data.²⁴ Specifically, the 2013 Form 477 Order required that filers submit their mobile broadband deployment data by unique combinations of technology, spectrum band utilized, and minimum

²¹ As noted in the 19th Competition Report, there is currently no standard definition of what qualifies as 5G. 19th Competition Report, 31 FCC Rcd at 10542, n.36. Under the developing 3GPP standards, 5G will likely include: (i) higher-quality mobile broadband services (higher speed and lower latency allowing for services such as multi-person video calling, real-time gaming, UHD video streaming and virtual reality); (ii) new “control and communications services” such as autonomous vehicles and enabling advancements in industrial automation, smart grids, aviation and the medical field; and (iii) connecting the Internet of Things (IoT) (smart homes; wearables; utility metering, etc.). See, e.g., 3GPP, SA1 Completes its Study into 5G Requirements (Jun. 23, 2016); http://www.3gpp.org/news-events/3gpp-news/1786-5g_reqs_sal; Qualcomm, Leading the World to 5G (Feb. 2016); Ericsson, 5G Use Cases, <https://www.ericsson.com/en/5g/use-cases> (last visited July 31, 2017).

²² 47 CFR § 25.103 (“Mobile-Satellite Service (MSS”).

²³ See *infra* paras. 45-49.

²⁴ 2013 Form 477 Order, 28 FCC Rcd, at 9898, para. 24.

advertised or expected speed.²⁵

18. Under the current Form 477 reporting framework, facilities-based providers of mobile wireless broadband service are required to submit shapefiles depicting their broadband network coverage areas for each transmission technology deployed in each frequency band.²⁶ Although the Commission in the *2013 Form 477 Order* concluded that collecting deployment information by spectrum band would enable it “to analyze deployment in different spectrum bands” and “facilitate the formulation of sound and informed spectrum policies,”²⁷ to date the Commission has not used the spectrum band information from Form 477 in its mobile broadband coverage analysis.²⁸

19. We propose to eliminate the requirement that mobile broadband providers submit their broadband deployment data by spectrum band. We anticipate that eliminating the requirement to provide spectrum band information would greatly streamline and reduce the burdens on providers by reducing the number of shapefiles (and the amount of the associated underlying data processing) they are required to submit.²⁹ Moreover, currently we are not aware of any significant purpose for which these data might be used, although we seek comment on whether to continue to collect these data as they might be helpful for our analysis in future proceedings. We also seek comment on any alternative approaches we should consider in lieu of adopting our streamlining proposal. For example, should the Commission consider adopting an alternative process under which providers might provide a list of bands and the associated amount of spectrum used to provision various mobile technologies by some geography, such as the CMA? Would this approach be less burdensome than the requirement to submit shapefiles for each spectrum band, particularly for smaller providers? Would this approach be beneficial by providing data that would allow us to track more easily new spectrum deployments? Would it, for instance, provide a valuable source of information regarding the timing and provision of LTE on 3.5 GHz spectrum as well as the deployment of 5G services in the various low, mid, and high spectrum bands?

20. Additionally, we seek comment about whether to eliminate or modify the requirement that mobile broadband providers report coverage information for each technology deployed in their networks. We seek comment on whether the Commission should simplify the filing process by requiring that coverage maps be provided for four categories of technology—3G, 4G non-LTE, 4G LTE, and 5G—rather than by each specific broadband technology, and how these categories should be defined. Are these categories defined and distinct enough to ensure accurate and meaningful reporting? Are the distinctions between categories, such as 4G versus 5G, clear enough for the data to be meaningful and for respondents to accurately submit data? Will the Commission need to specify which technologies correspond to which category? Currently, the Form 477 instructions set out specific technology codes for nine different mobile technologies.³⁰ In our experience, the separate reporting of coverage information by every one of these nine specific mobile technologies has not added useful information for the purposes of

²⁵ *Id.* at 9908-09, para. 42. Facilities-based providers of mobile wireless broadband service submit, and certify the accuracy of, polygons representing those areas where, for a specified technology, “users should expect the minimum advertised upload and download data speeds associated with that network technology” *Id.* at 9908-09, 9920, paras. 42, 77.

²⁶ *Id.* at 9908, para. 42; *Form 477 Instructions* at 24.

²⁷ *Id.* at 9910, para. 45.

²⁸ In the context of analyzing build out and renewal representations, for instance, rather than relying on the data it collects through Form 477, the Commission often asks for coverage information by spectrum band directly from providers.

²⁹ For example, a provider currently providing LTE in four spectrum bands would only have to submit one shapefile representing its coverage rather than four shapefiles.

³⁰ The nine technology codes are LTE, WiMAX, HSPA+, EVDO/EVDO Rev A, WCDMA/UMTS/HSPA, CDMA, GSM, Analog, and Other. *Form 477 Instructions* at 31.

Commission decision-making, and such information is not currently used in our analysis of the data received.³¹ We seek comment on whether eliminating the requirement or modifying the information required to be reported in this manner would be a significant reduction in the filing burden.

21. We turn next to our consideration of mobile broadband service availability data. Currently, mobile broadband providers are required to submit data where their service is “available.”³² To comply with this requirement, mobile broadband providers must submit a comma separated values (CSV) file of all census tracts where the provider’s mobile wireless broadband service is advertised and available to actual and potential subscribers.³³ This requirement was designed to identify those geographic areas where a service provider has coverage but is not affirmatively offering service to subscribers through a local retail presence.³⁴

22. The Commission’s experience with the collection of this information, however, has shown that the mobile broadband service availability data that providers submit generally do not reflect their local retail presence. Instead, we have found that filers claim that their service is available beyond where they may have a local retail presence. In view of our experience with these data, we seek comment about the continued significance of local retail presence information. We propose eliminating the requirement to submit mobile broadband service availability data, as it is not producing accurate information about where services are affirmatively available to American consumers.

3. Mobile Voice Deployment

23. Next, we seek comment about how the Commission might revise its data collection on the deployment of mobile voice services. The *2013 Form 477 Order* required filers to submit the voice coverage boundaries “where providers expect to be able to make, maintain, and receive voice calls.”³⁵ The Order also required that providers submit voice deployment shapefiles representing geographic coverage nationwide for each technology and frequency band.³⁶ We seek comment about whether to revise these requirements.

24. We continue to view the collection of mobile voice deployment data as important for tracking changes in the mobile landscape and informing the Commission’s analysis of mobile voice services that are available to consumers. We seek comment, however, on whether there are ways that we may refine our collection of this information to reduce burdens for providers. Specifically, we seek comment on whether to eliminate the requirement to submit voice coverage data by technology and spectrum band. Does the Commission still need these data to accurately evaluate the mobile voice services that are available to subscribers? Is the distinction between voice and broadband coverage significant, or do providers most often include mobile voice coverage wherever they have some form of broadband coverage? If providers include mobile voice coverage wherever they have broadband coverage, should the Commission revise its requirements to allow providers to simply check a box

³¹ See, e.g., *19th Competition Report*, 31 FCC Rcd 10534.

³² The *2004 Broadband Data Gathering Order* required filers reporting mobile wireless broadband subscribers to provide a “list of Zip Codes that best represent the filer’s mobile wireless broadband coverage areas.” *Local Telephone Competition and Broadband Reporting*, Report and Order, 19 FCC Rcd 22340, 22349-50, para. 18 (2004) (*2004 Broadband Data Gathering Order*). The accompanying Form 477 instructions adopted in that Order provide that the Zip Codes reported “should be the Zip Codes in the state in which the mobile wireless broadband service provider’s service is advertised and available to actual and potential subscribers.” *Id.* at 22393.

³³ *Form 477 Instructions* at 25; see also *2013 Form 477 Order*, 28 FCC Rcd at 9909-10, para. 44.

³⁴ *2013 Form 477 Order*, 28 FCC Rcd at 9909-10, para. 44.

³⁵ *Id.* at 9912, para. 53.

³⁶ *Id.*

indicating that they provide voice coverage wherever they have a particular mobile broadband technology? How would we account for areas in which a provider provides only mobile voice services?

25. To the extent that the collection of mobile voice deployment data by technology is still necessary, should we continue to collect GSM, CDMA and Analog voice data separately? Should we collect separate voice deployment data for VoLTE and mobile switched voice? We anticipate that revising the data collection in this manner would help the Commission assess where providers claim to have VoLTE coverage and assist our efforts in the areas of emergency response. We seek comment on the importance of collecting information about VoLTE coverage.

4. Mobile Broadband and Voice Subscription

26. We seek comment on how we can improve the data we collect on mobile broadband and voice subscription. Form 477 currently requires that mobile voice and broadband subscriber information be submitted at the state level.³⁷ Given the aggregate nature of the current data collection, the Commission currently uses telephone number-based Number Resource Utilization/Forecast (NRUF) data for its subscriber and market share analysis in secondary market transaction review and other proceedings. The NRUF data, however, have certain limitations; for example, NRUF data are more a measure of the number of mobile wireless connections than subscribers.³⁸

27. With respect to the existing Form 477 subscription data, because subscriber data are collected at the state level, they are not sufficiently granular for meaningful evaluation of mobile service subscribership, as noted. Subscription data at a more disaggregated geographic level would significantly improve the Commission's ability to provide more accurate mobile competition analyses, particularly in our secondary market transactions review.

28. While the Commission's 2011 Form 477 NPRM raised the issue of requiring mobile subscribership reporting at a more granular level,³⁹ the 2013 Form 477 Order did not change the state-level reporting requirement.⁴⁰ Today, we propose requiring mobile providers to aggregate their subscribership data to the census tract level, based on each subscriber's billing address.⁴¹ This

³⁷ Form 477 Instructions at 25, 27.

³⁸ It is increasingly more difficult to determine the number of mobile subscribers through the use of NRUF data because consumers are more likely to use more than one mobile device that have been assigned telephone numbers—particularly non-voice devices, such as Internet access devices (e.g., wireless modem cards and mobile Wi-Fi hotspots), e-readers, tablets, and telematics systems. Also, predicting the number of devices using this dataset is difficult as some mobile devices do not have telephone numbers assigned to them. Moreover, because a subscriber can move and retain the same mobile number, subscribers may not be attributed to the state in which the subscriber receives or pays for service in some cases (someone with an 812 Southern Indiana area code may live in California, for example, but is attributed to Indiana for NRUF purposes.).

³⁹ *Modernizing the FCC Form 477 Data Program; Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advances Services to all Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscribership; Service Quality, Customer Satisfaction, Infrastructure and Operating Data Gathering; Review of Wireline Competition Bureau Data Practices*, Notice of Proposed Rulemaking, 26 FCC Rcd 1508, 1537, para. 81 (2011) (2011 Form 477 NPRM).

⁴⁰ The 2013 Form 477 Order did not address the issue except to say that, if Bureau-level technical improvements reduce filer burden, then “we may consider moving voice and broadband subscription data, for fixed and possibly mobile services, to the census block.” 2013 Form 477 Order, 28 FCC Rcd at 9918, para. 70.

⁴¹ This would parallel the requirement for fixed services. *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscribership*, Report and Order and Further Notice of Proposed Rulemaking, 23 FCC Rcd 9691, 9696-98, paras. 12-14 (2008); 2013 Form 477 Order, 28 FCC Rcd at 9903-04, 9916, paras. 34, 64.

information would be collected as CSV files and would provide a more granular understanding of where consumers are subscribing to service.

29. Would collecting subscribership data at the census-tract level be sufficient to improve the quality of the Commission's data on subscribership? Are subscribers' billing addresses sufficiently correlated with the areas in which subscribers use their mobile wireless devices to be meaningful in our competitive analyses, and if not, what else should we consider? Does the answer differ for residential and business accounts? Should we consider requiring subscribership data for a different geographic area? For example, while reporting subscribership at the census-tract level would parallel the requirement for fixed service, what are the costs and benefits of reporting at a different geographic level? Whatever the geographic level adopted, we seek comment on whether using the billing address to assign subscribers to a census tract would be appropriate or, in the alternative, whether using the customer place of primary use address⁴² would be preferable as it may be less burdensome for providers. How should filers assign resold lines and broadband-only lines to the more granular geographic level? How should we consider subscribership with respect to 5G services and the IoT? What metrics might we consider in measuring subscribership?

B. Fixed Services

1. Fixed Broadband Deployment Data

a. Collection of Business, Enterprise, and Government Services Fixed Broadband Deployment Data

30. For each census block in which providers submit fixed broadband deployment data, providers must report whether they deploy "mass market/consumer" service and/or "business/enterprise/government" service.⁴³ All facilities-based fixed broadband providers, including cable operators, must report the census blocks where they make fixed broadband services available to residential and business customers at bandwidths exceeding 200 kbps in at least one direction.⁴⁴ We currently require providers offering business/enterprise/government services to report the maximum downstream and upstream contractual or guaranteed data throughput rate (committed information rate (CIR)) available in each reported census block.⁴⁵ If, in a particular block, providers offer business/enterprise/government services that do not have a contractual or guaranteed data throughput rate (i.e., they are "best efforts" services), then the maximum downstream and upstream contractual or guaranteed data throughput rates should be reported as "zero."⁴⁶

31. We seek comment on whether we should eliminate the separate reporting of available contractual or guaranteed data throughput rates for business/enterprise/government services, while maintaining separate indicators for mass market/consumer service and/or business/enterprise/government deployment. We use the Form 477 data in connection with many of our proceedings and programs, including the Broadband Progress Report,⁴⁷ Universal Service Fund proceedings,⁴⁸ the *2017 BDS Order*,⁴⁹

⁴² 4 U.S.C. § 124(8).

⁴³ FCC, *How Should I Format My Fixed Broadband Deployment Data?* (Dec. 5, 2016), https://transition.fcc.gov/form477/FBD/formatting_fbd.pdf

⁴⁴ *2013 Form 477 Order*, 28 FCC Rcd at 9902-03, paras. 32-35; *Form 477 Instructions*, Section 5.3, "Fixed Broadband Deployment" at 17.

⁴⁵ FCC, *How Should I Format My Fixed Broadband Deployment Data?* at 2 (Dec. 5, 2016), https://transition.fcc.gov/form477/FBD/formatting_fbd.pdf.

⁴⁶ *Id.*

⁴⁷ See, e.g., *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the* (continued....)

as well as mergers and other transactions.⁵⁰ In our experience, the information collected for consumer/residential/mass market data already provides the necessary bandwidth data in each of these cases. The added CIR data for business/enterprise/government services do not appear to provide additional useful insight, while collecting these data as a separate category imposes an additional burden on filers. We therefore propose to discontinue the collection of CIR data, and we seek comment on this proposal. We also seek comment on the best way to collect data reflecting the speeds offered to business/enterprise/government end-users in the absence of CIR data. Will the maximum advertised down- and upload speeds used for mass-market work for business best-efforts data collection? How can we capture speeds for business/enterprise/government end-users that are not best-efforts?

32. In interactions with filers, staff also have found that filers may be reporting CIR data incorrectly in some cases. It is not unusual for filers to report speeds as contractually guaranteed, when in fact they are best-efforts services. As the technology for providing business/enterprise/government services continues to evolve, along with the demand for them, providers increasingly use a variety of technologies in addition to TDM and fiber to serve customers, including mass market service, HFC, UNEs, and Dark Fiber—with and without contractual service level guarantees. If commenters believe that we should continue to separately collect bandwidth information specific to contractually guaranteed business/enterprise/government services, how can we ensure that providers accurately characterize their offerings? Should we require filers to report the maximum bandwidths of business service offered in a given census block and indicate whether the service is best efforts and/or contractually guaranteed? Alternatively, should we require fixed broadband providers to continue to report whether they offer business/enterprise/government services, but no longer report any speed data associated with such services? We note that this approach would lessen the burden on filers, but would it also help ensure more accurate reporting? Would information about business/enterprise/government services still be valuable in the absence of speed data, or would it be better to remove the requirement to report these data altogether?

b. Fixed Deployment Data Reporting Generally

33. Facilities-based providers of fixed broadband must provide in their Form 477 submissions a list of all census blocks where they make broadband connections available to end-user premises, along with the last-mile technology or technologies used.⁵¹ These deployment data represent

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Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Docket No. 15-191, 2016 Broadband Progress Report, 31 FCC Rcd 699, 729, para. 73 (2016) (*2016 Broadband Progress Report*).

⁴⁸ See, e.g., *Connect America Fund; ETC Annual Reports and Certifications; Developing a Unified Inter-carrier Compensation Regime*, Report and Order, Order and Order on Reconsideration, and Further Notice of Proposed Rulemaking, 31 FCC Rcd 3087 (2016) (*Rate of Return Reform Order*).

⁴⁹ *Business Data Services in an Internet Protocol Environment; Technology Transitions; Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, WC Docket No. 16-143, GN Docket No. 13-5, WC Docket No. 05-25, RM-10593, Report and Order, FCC 17-43, (2017).

⁵⁰ See, e.g., *Applications of Charter Communications, Inc., Time Warner Cable Inc., and Advance/Newhouse Partnership for Consent to Assign or Transfer Control of Licenses and Authorizations*, MB Docket No. 15-149, Memorandum Opinion and Order, 31 FCC Rcd 6327 (2016).

⁵¹ *Form 477 Instructions* at 17; FCC, *Fixed Broadband Deployment Data from FCC Form 477*, <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477> (last visited July 31, 2017). The relevant requirement in the Form 477 Instructions states, “[f]or purposes of this form, fixed broadband connections are available in a census block if the provider does, or could, within a service interval that is typical for that type of connection—that is, without an extraordinary commitment of resources—provision two-way data transmission to and from the Internet with advertised speeds exceeding 200 kbps in at least one direction to end-user premises in the census block.” *Form 477 Instructions* at 17.

the areas where a provider does, *or could*, without an extraordinary commitment of resources, provide service.⁵² Thus, the meaning of “availability” in each listed census block can be multifaceted, even within the data of a single filer. In a particular listed block, the provider may have subscribers or it may not. At the same time, the provider may be able to take on additional subscribers or it may not. The various combinations have varying implications that make it difficult to understand availability. Specifically, if a block was listed by a provider, it is impossible to tell whether residents of that block seeking service could turn to that provider for service or whether the provider would be unable or unwilling to take on additional subscribers. This may limit the value of these data to inform our policy-making and as a tool for consumers and businesses to determine the universe of potential Internet service providers at their location.

34. We seek comment on whether to require fixed broadband providers to indicate whether total customers served on a particular technology could be increased in each census block listed when they report deployment data. We specifically seek comment on whether all fixed broadband providers should be required to identify on Form 477 three categories of service areas for each technology code: (1) areas where there are both existing customers served by a particular last-mile technology, and total number of customers using that technology can, and would, be readily increased within a standard interval upon request; (2) areas where existing customers are served but no net-additional customers using that technology will be accommodated;⁵³ and (3) areas where there are no existing customers for a particular technology but new customers will be added within a standard interval upon request.⁵⁴ If we determine to add such a requirement, we seek comment on how providers would identify the relevant geographic units. For example, if a satellite provider could not increase the total number of new subscribers in a spot beam, would they be able to indicate the speed and/or the capacity to increase the total number of subscribers at various locations in the beam at the block or sub-block level? Would this modification to the current requirements elicit data that are more accurate and useful to the Commission, other policymakers, and the public than the deployment data we currently collect? These distinctions could help policymakers understand which areas may be limited for service expansion using specific technologies and which areas may be capable of increasing the total number of subscribers using specific technologies. Doing so would offer the Commission, as well as other users of these data, a more nuanced picture of deployment. It would be possible to see, for example, where providers are building capacity, using which technologies, and similarly where they are not.

35. We seek comment on the specific costs for fixed broadband providers to report such data, and how to ensure that reporting the data would be as minimally burdensome on filers as possible. Is it reasonable, for example, to assume that fixed broadband providers are aware of whether they have the capacity in place to make their service available and add new subscribers in a particular location? Do providers routinely maintain information about their service areas that would enable them to provide this information readily, or would this proposal require them to develop new information? We seek comment on the estimated time required to produce the data and ask commenters to provide us with the incremental costs of any new software development in addition to the average wage rate estimate. Commenters should also address whether technical or other features of particular transmission technologies would raise issues that would make this information more or less difficult to report.

c. Granularity

36. As previously stated, Form 477 collects fixed broadband deployment data on the census-block level. In the 2013 *Form 477 Order*, the Commission considered and rejected collecting the data on

⁵² *Id.*

⁵³ For example, any new customer and/or legacy DSL or cable modem customer requesting a service package change must switch to the provider’s fiber-to-the-premises service; or, for example, there are satellite broadband subscribers in service in the census block but no capacity to increase the total number of subscribers.

⁵⁴ For example, satellite capacity is available to serve that census block but as yet no subscriber has signed up.

a more granular level.⁵⁵ Although recognizing that more granularity may be beneficial in the context of many of our proceedings, the Commission concluded at that time that the administrative and data-quality challenges to collecting data below the census-block level likely would make such an endeavor impractical.⁵⁶

37. More recently, we have requested that specific providers involved in certain of our proceedings provide us with fixed broadband deployment data on a more granular basis than by census block. For example, we currently collect location-level data from recipients of USF funding to assess whether they are meeting their buildout requirements.⁵⁷ We have found this more granular data to be extremely useful in understanding issues surrounding fixed broadband deployment in these contexts and believe that it could be useful if residential deployment data in particular were more generally available to us.⁵⁸ We note that stakeholders have recommended collecting and reporting deployment data at various sub-census block geographies, including at the street-address or parcel level.⁵⁹

38. We seek comment on giving fixed-broadband providers the option of reporting their deployment data by filing geospatial data showing coverage areas (i.e., polygons of coverage filed via shapefiles or rasters) as providers of mobile broadband and voice service currently are required to do⁶⁰ – instead of reporting a list of census blocks. This could reduce the burden on filers. Since the current Form 477 interface can accept geospatial data, accepting similar data from fixed broadband providers should not present a significant technical burden for the Commission. We seek comment on whether providers of wired, fixed-terrestrial or fixed-satellite broadband routinely store their broadband footprints as geospatial coverage data. To the extent providers do not routinely store data in such a format, or to ensure comparability among different providers' data, we also seek comment on how to specify a single methodology for determining the coverage area of a network.⁶¹ What burdens would be associated with creating such geospatial data? In addition, since we lack the locations of individual homes (or businesses), knowing the areas served does not provide information about the location or number of homes that have or lack service (i.e., it provides information on the areas that have or lack service, not the homes that lack service). Should we assume that all homes within a block have service even if only a fraction of a block's area has service? Should we assume that the fraction of a partially served block with the service correlates with a fraction of homes within that block that have service?⁶² We seek comment

⁵⁵ 2013 Form 477 Order, FCC Rcd at 9904-05, para. 35.

⁵⁶ *Id.*

⁵⁷ See 47 C.F.R. § 54.316.

⁵⁸ We note, for example, that census blocks in rural areas can be quite large and providers may only deploy service throughout a portion of a census block.

⁵⁹ See, e.g., Letter from J. Brent Legg, Vice President, Government Affairs, Connected Nation, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 11-10, at 1 (filed July 24, 2017).

⁶⁰ See Form 477 Instructions, Section 5.8, "Mobile Broadband Deployment" at 24.

⁶¹ For example, there are standard geospatial-data tools to define the minimum bounding geometry given a set of lines or points as providers might have to describe coverage of wired networks (See, e.g., ArcGIS Pro, *Minimum Bounding Geometry* <http://pro.arcgis.com/en/pro-app/tool-reference/data-management/minimum-bounding-geometry.htm> (last visited July 31, 2017)). However, even the smallest area output from such a tool, the convex hull, will, in some cases, overstate the area the providers could serve. For example, a provider that offers service in a ring around a town (an annulus or "o" shape) would, if they used any standard geospatial tool to create shapefiles or raster data to file, create and file geospatial data of a circle that includes the town in the center where they do not offer service.

⁶² This would mean determining what fraction of people or homes (e.g., tenths or hundredths) have had broadband deployed. Over larger areas, such fractional people or homes would likely tend to reflect overall coverage; but over smaller areas would reflect a probabilistic estimate of coverage rather than an accurate count of people or homes lacking coverage.

about how we could make the best use of such geospatial data to find the number and location of the unserved, and the value of such data compared to the burden of such a filing.

39. We also seek comment on collecting data at a sub-census-block level. While collection of data by street address, for example, could increase the complexity and burden of the collection for both the Commission and the filers, we seek comment on the scope of this burden and potential corresponding benefits. For example, having national, granular broadband deployment data could greatly assist with any future disbursement of high-cost funds or universal service reverse auctions, assist consumers with locating broadband competition in their area, and with other broad public policy goals. With more than 130 million housing units in the country, an address-level dataset could have as many as roughly 750 million records for each filing;⁶³ based on the scale of this dataset, a household-level collection could require significant additional time and other resources to establish and carry out. We also seek comment on whether there is a publicly available, nationwide data set containing the address and location (latitude and longitude; and for Multiple Dwelling Units (MDUs), possibly altitude information to distinguish data about units on different floors) for each housing unit in the country, such that filers, or the Commission could geocode street addresses.⁶⁴ We additionally seek comment on whether the Commission should require providers to submit the service address for every housing unit at which service is available. While this approach would require the Commission to take on the cost of geocoding all the filings, it would potentially relieve burden on the industry.⁶⁵ If the Commission requires service address reporting, we seek comment on ways the Commission could make the reporting less burdensome on providers and the Commission. For example, should the Commission require specific formatting for submission of address-level data? In addition, how could Commission staff find latitude and longitude for addresses that do not provide a full match from a geocoding service?

40. As an alternative, we seek comment on whether the Commission should require providers to geocode all the addresses at which service is available. We seek comment on the costs and benefits associated with this approach, and on ways that the Commission could ease the burden on filers. For example, should the Commission specify a single geocoding methodology to be used by all providers (e.g., require all providers to use a single geocoding service, and specify how to handle any geocoding partial matches or failures), or require that providers file a latitude and longitude measured in the field? If the Commission accepts multiple geocoding methodologies, or a mix of geocoding and field geolocating, can Commission staff determine when two points filed by different providers represent the same location? Do providers typically know every address to which they could provision service? Are there ways that the Commission could improve its submission portal to make filing this kind of data less burdensome on providers?

⁶³ Our current fixed-broadband-deployment data set contains over 70 million records (of those 70 million, more than 55 million records are for consumer broadband; of those, almost 37 million records are in the roughly 6.5 million census blocks with at least one housing unit or population; i.e., there are between 5 and 6 reports of broadband per census block on average). If we received 5-6 reports of broadband deployed to each of the 130-plus million housing units, it would total roughly 750 million records.

⁶⁴ And, given that the number of housing units changes each year, we are similarly unaware of a means to update such a data set or of publicly available and annually updated source of housing units or population counts in each block that is publicly available and updated annually. See FCC, *Staff Block Estimates*, <https://www.fcc.gov/reports-research/data/staff-block-estimates> (last visited July 31, 2017).

⁶⁵ This task, assuming a 99 percent success rate at geocoding, would require Commission staff to handle several million addresses for which they would not have a latitude and longitude. Specifying the format of the address can mitigate the extent of geocoding failures but not eliminate it (and could likely lead to higher provider burden). A 2014 comparison of eight geocoding services found that each service failed to provide a full match for at least 4 percent of test addresses in largely urban areas (and, even among addresses with a match, sometimes provided coordinates far from the actual location). See <http://spatial.usc.edu/wp-content/uploads/2014/03/gislabtr10.pdf>.

41. We also seek comment on other sub-census block alternatives, such as collecting data about what street segments providers cover. This approach could avoid some of the problems with address-level collections—providers would not need to know every address they cover, only the geographic areas; and there would be no need for geocoding. Such a collection would provide an indication of the road segments where service is available (or, perhaps, road segments along which facilities run), and by extension, road segments along which there is no service or facilities. However, without a data set of housing-unit locations, this method would not yield information on how many homes are along road segments with service and how many are along road segments that lack service. Service might be concentrated in areas where people live in some blocks but not available to all homes in other blocks. A street-segment data collection would not allow us to differentiate those two very different possibilities.⁶⁶ In short, lacking a data set with the location of each housing unit, this approach would provide a map of roads that lack fixed-broadband service or facilities, not an indication of the number or location of homes or people that lack service. We seek comment on these conclusions, and on suggestions for resolving these concerns. What are the costs and benefits of adopting a street segment approach for data collection?

42. We note that NTIA collected sub-block level data for blocks larger than two square miles for the National Broadband Map, but also that such data did not provide an indication of where homes lacked broadband availability. For such large blocks, some providers filed data indicating road lengths along which they stated their service was available, others provided points where service was available, and fixed wireless providers supplied geospatial data indicating their coverage areas. However, because no database indicated where the housing units were actually located within these large blocks, the number of housing units that could actually receive service could not be determined. In other words, while the data indicated what *areas* did not have service available, the data did not provide information on whether any *homes* or *people* in the areas lacked service, or whether the parts of the census blocks with service available included all homes. The National Broadband Map took different approaches to dealing with this uncertainty over time, for example, treating partially served blocks as being half served plus-or-minus half (i.e., indicating a literal uncertainty); or creating a random distribution of housing units within a block and determining the fraction of those random points that were covered by the reported service (i.e., creating pseudo-data to fill in for what was not known). In short, the sub-block level data provided a statistical estimate, at best, of coverage.⁶⁷

43. Another approach to understanding sub-block coverage would be to require broadband providers to identify blocks that they can fully serve.⁶⁸ Under this approach, in addition to filing data on technology and download and upload speed, providers would submit data indicating, for each block, whether they can make service available to all locations (residential and business) within the block. We seek comment on whether fixed broadband providers, particularly providers of wired broadband services, know whether any locations within each block are beyond the reach of their facilities, such that they could not make service available within a typical service interval. How burdensome would it be for providers to make such a determination for each block in their footprint? Would such data be more useful to the

⁶⁶ This is analogous to the problem of knowing what areas have service but not whether there are any homes in those areas described above, but applies to line segments rather than areas. *See supra* para. 38.

⁶⁷ *See, e.g.,* National Broadband Map, *Post Processing Data*, <https://www.broadbandmap.gov/about/technical-overview/post-processing-data> (last visited July 31, 2017).

⁶⁸ *See, e.g.,* *Defining and Mapping Broadband Coverage in America: Hearing Before the Subcomm. on Communications and Technology of the H. Comm. On Energy and Commerce*, 115th Cong. (2017) (statement of Carol Matthey, Principal, Matthey Consulting LLC), available at <http://docs.house.gov/meetings/IF/IF16/20170621/106153/HHRG-115-IF16-Wstate-MattheyC-20170621.pdf>, at 6.

Commission than the fixed deployment data we currently collect?⁶⁹ If the Commission had information about fully covered blocks, it would also know, for each provider, which blocks are *not* fully covered. Should the Commission collect geocoded deployment data for blocks that are less-than-fully covered from each provider? Collecting sub-block geocoded data for only a subset of blocks would address some of the challenges outlined above simply by reducing the amount of data to be collected and filed, but would not address other challenges, such as the accuracy of geocoding, or the challenge of determining where locations lie along road segments.⁷⁰ We seek comment on how to overcome the challenges identified in collecting sub-block data, as well as the benefits and burdens of seeking more granular data for a subset of blocks.

44. In sum, we seek comment on whether we should move to a more granular basis for reporting deployment data and, if so, what basis would be appropriate. For each basis they support, commenters should explain in detail the methodology or approach they propose for capturing the data in a sufficiently uniform format to facilitate processing (e.g., geocoding, latitude/longitude, address). Commenters also should address the expected burden to filers and to the Commission. Commenters should also articulate the relative benefits of each approach. For example, do filers routinely maintain the data needed to comply with the reporting requirements and, if not, what costs will be associated with obtaining them, both at the outset and on an ongoing basis? Are there other methodologies for collecting fixed broadband deployment data that have lower associated costs relative to the expected benefit?

d. Improvements for Satellite Broadband Deployment Data

45. We also seek comment on whether the Commission should modify the Form 477 requirements relating to satellite broadband deployment data to address issues unique to satellite broadband service.⁷¹ Since satellite providers initially reported that they could provide service to millions of census blocks, the *Form 477 Instructions* were amended to reduce burden on such filers by giving them the opportunity to streamline their data under certain circumstances. Specifically, the *Form 477 Instructions* state that “[s]atellite providers that believe their deployment footprint can be best represented by every block in a particular state or set of states may abbreviate their upload file by submitting only one block-level record for each state included in the footprint and providing a note in the Explanations and Comments section.”⁷² Through the use of that method, one or more satellite providers have indicated on Form 477 that they deploy satellite broadband at certain speeds ubiquitously across the United States.⁷³ We seek comment on how to minimize burdens for providers with large footprints to report while maintaining variation in the data.

46. We seek comment specifically on eliminating the option to file abbreviated fixed broadband deployment data for each state. Will removing the option of filing abbreviated fixed

⁶⁹ For example, in blocks that are only partially covered by more than one provider, the Commission would not have a way of determining whether, in aggregate, all locations are covered (i.e., whether the providers that report coverage in the block collectively cover all locations), absent the collection of additional, sub-block data.

⁷⁰ See *supra* paras 38-42.

⁷¹ 47 CFR § 1.7001(b); 2013 *Form 477 Order*, 28 FCC Rcd at 9902, para. 32; *Form 477 Instructions* at 17.

⁷² *Form 477 Instructions* at 17. See also FCC, *FCC Form 477: How Should I Format My Fixed Broadband Deployment Data?* at 5-6 (Dec. 5, 2016), https://transition.fcc.gov/form477/FBD/formatting_fbd.pdf.

⁷³ For example, at least one satellite broadband provider reports that its broadband service ranging from 5 Mbps to 25 Mbps download speeds is deployed nationwide, as of June 2016. See FCC, *Fixed Broadband Deployment Data from FCC Form 477*, <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477> (last visited May 4, 2017). In the past, the Commission has noted that the satellite broadband deployment data contain deficiencies that substantially limit their usefulness and reliability. For example, in the 2016 *Broadband Progress Report*, the Commission stated that “as we have explained in prior Reports, the Commission has previously had ‘significant concerns about the quality and reliability of the mobile and satellite service data.’” 2016 *Broadband Progress Report*, 31 FCC Rcd at 706, para. 15.

broadband deployment data improve the accuracy of the data? Should satellite broadband providers instead report a list of all census blocks, similar to other fixed broadband providers?⁷⁴ What if any incremental burden on satellite providers is likely to result from eliminating the abbreviated option? Are there any other options for satellite broadband providers?

47. We note that satellite-based broadband networks, like all fixed-broadband networks, have capacity limits in some parts of the network, and that networks are not generally capable of serving all potential customers across a large footprint (such as the continental United States) at once. We seek comment on whether satellite's unique characteristics (e.g., the relatively large area over which satellite providers state they provide coverage, the inherent flexibility of wide-area beams and spot beams, or the difficulty of adding new satellite capacity beyond current space station limits) make satellite coverage, in particular, more difficult for providers to characterize at the census block level.⁷⁵ Would revising deployment reporting for all fixed providers, as discussed above, address issues that may affect the accuracy of satellite reporting? If we determine not to revise the deployment reporting obligations for all fixed broadband providers, are there steps we should take to address specific issues relating to satellite deployment, such as capacity constraints in areas in which service is currently reported as "available"? If satellite does face unique challenges, how can we change the data collection to improve data for satellite while maintaining comparability to other fixed-broadband data? In the future, the Commission will also need to account for large Non-Geostationary Orbit (NGSO) satellite constellations that plan to provide broadband services.⁷⁶ We seek comment on what steps we can take to achieve this.

48. We also seek comment on whether, if we do not revise deployment reporting requirements to allow all providers of fixed broadband service to file shapefiles or rasters in lieu of census blocks, we should allow satellite providers to do so. Would satellite providers face lower burdens and/or would the data quality improve if the Commission accepted geospatial data rather than block-level data from satellite providers? We note, as discussed in the *2013 Form 477 Order*, that satellite broadband providers already submit coverage-area information as part of a satellite application or letter of intent.⁷⁷ While information submitted at the application phase is extremely useful to that process, the Commission continues to believe that it is essential to gather data regularly via Form 477 to reflect as-built, rather than as-planned, network deployment. Given satellite providers' experience in developing geospatial data, we seek comment on whether requiring satellite deployment data to be filed in that format would significantly reduce filer burden.

49. Are there other issues unique to satellite that affect the accuracy or utility of the data we collect and, if so, what approaches could we take to address them? What are the costs and benefits of these approaches?

⁷⁴ *Form 477 Instructions* at 17.

⁷⁵ The term "satellite beam" refers to the direction in space toward or in which the energy transmitted by the satellite is focused. "Beam coverage area" signifies the geographic area on the surface of the Earth within the satellite beam in which signal levels transmitted by the satellite are high enough to provide service to customers. Spot beams are high-power beams concentrated in a particular area. Beam coverage areas may vary over time, likely reflecting subscriber demand.

⁷⁶ WorldVu Satellites Limited, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System, Order and Declaratory Ruling, IBFS File No. SAT-LOI-20160428-00041, Call Sign S2963, FCC 17-77 (2017).

⁷⁷ *2013 Form 477 Order*, 28 FCC Rcd at 9901, para. 28.

2. Publishing Voice Line Subscriber Counts by SAC

50. Rate-of-return carriers currently submit their fixed voice subscription (FVS) counts by study area to USAC on an annual basis, and the FCC publishes those data.⁷⁸ We believe these data provide useful information to the public about the extent of voice subscriptions in each carrier's study area. However, under a rule recently adopted in our CAF proceeding, rate-of-return carriers switching to the Alternative Connect America Cost Model and Alaska Plan carriers may no longer report such data to USAC for their legacy study area boundaries.⁷⁹ In order to maintain the reporting of this information, we propose to use the Form 477 FVS data, in conjunction with Study Area Boundary data, to develop and publish aggregated voice line counts for every study area, to mirror the approach used to collect these data from price-cap carriers. We seek comment on this proposal and on the methodology for generating this metric. While we have generally determined not to routinely release filer-specific data collected on Form 477, in this case, the information, collected via another source, has been routinely publicized.⁸⁰ Accordingly, we believe that the value of using the Form 477 data for this purpose outweighs any associated confidentiality interest in the confidentiality of the data. We seek comment on this and on whether the use of Form 477 data is the most efficient and effective means for collecting data.

C. Other Issues

1. Revisions to Confidential Treatment of Information

a. Mobile Broadband Data

51. We propose that certain collected data that are currently treated as confidential be made public. First, we propose that minimum advertised or expected speed data for mobile broadband services should not be treated as confidential, and we propose releasing such data for all subsequent Form 477 filings going forward.⁸¹ Currently, the providers' Form 477 minimum advertised speeds have been treated as confidential and consumers and policy makers have been limited in their ability to compare offerings from this collection. This information, however, is already available from other sources. For example, providers routinely make available on their websites information about the typical upload and download speeds their network offers in particular geographic areas.⁸² Because speed data information is

⁷⁸ See, e.g., FCC, Federal-State Joint Board Monitoring Reports, <https://www.fcc.gov/general/federal-state-joint-board-monitoring-reports>. (last visited June 30, 2017).

⁷⁹ *Rate of Return Reform Order*, 31 FCC Rcd 3087; see also *Connect America Fund*; *Universal Service Reform – Mobility Fund*; *Connect America Fund – Alaska Plan*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 10139 (2016).

⁸⁰ See, e.g., FCC, *Federal-State Joint Board Monitoring Reports, Supplementary Table: S.3.3. HC RoR Claims per Line-by Study Area*, <https://www.fcc.gov/general/federal-state-joint-board-monitoring-reports>, (last visited June 30, 2017).

⁸¹ We note that, in the context of the Mobility Fund II proceeding, several parties have expressed opposition to a proposal to release minimum advertised or expected 4G LTE speed data. See, e.g., T-Mobile Comments, WC Docket No. 10-90, WT Docket No. 10-208 at 4-5 (filed Apr. 26, 2017); see also *The Wireless Telecommunications Bureau and the Wireline Competition Bureau Propose to Release Form 477 4G LTE Mobile Speed Data to Facilitate Implementation of Mobility Fund II Support*, WT Docket Nos. 17-80, 10-208, WC Docket Nos 10-90, 11-10 Public Notice, DA 17-286 (2017).

⁸² See, e.g., AT&T, *Broadband Information* (last updated Apr. 24, 2017), <https://www.att.com/gen/public-affairs?pid=20879> (reporting a 4G LTE range between 6 and 29 Mbps); Sprint, *Important Coverage and Performance Information*, http://shop2.sprint.com/en/coverage/support/important_coverage_info_popup.shtml (last visited July 31, 2017) (reporting and LTE range of 6-8 Mbps and an LTE Plus range of 12-30 Mbps); T-Mobile, *About T-Mobile*, <https://www.t-mobile.com/company/company-info/consumer/internet-services.html> (last visited July 31, 2017) (reporting 4G LTE download speeds of 7-40 Mbps); Verizon Wireless, *4G LTE Speeds vs. Your Home Network* (July 19, 2017), <https://www.verizonwireless.com/archive/mobile-living/network-and-plans/4g-lte-> (continued....)

publicly available, we believe that it is not commercially sensitive, and its release will not cause competitive harm. In addition, we expect that dissemination of minimum advertised or expected speed data to the public would promote a more informed, efficient market by providing information that can aid in independent analyses.⁸³ Making such data available to the public provides consumers, states, and experts the opportunity to review the data to ensure the accuracy of the information.⁸⁴ We seek comment on our proposal. To the extent the Commission collects any other speed data that are currently treated as confidential, we seek comment on whether such data should also be made available to the public, again to promote a more informed, efficient market and aid in independent competitive analyses.

52. Similarly, we propose that, if detailed propagation model parameters are submitted in the Form 477 filings, some of these parameters should be treated as public information, as we believe that such parameters are not competitively sensitive. For example, terrain resolution, signal strength, and the loading factor are higher-level aggregate parameters and should not be treated as confidential. We seek comment on this proposal. If filers believe that certain propagation model parameters should be treated as confidential for competitive reasons, then they should provide a list of those parameters, and explain the underlying reasons why.

b. Other Data

53. *National-level, Fixed Broadband Subscriber Counts.* The Commission has historically determined not to make filer-specific broadband subscription data collected on Form 477 routinely available to the public.⁸⁵ Consistent with this determination, we have redacted and aggregated data as necessary to prevent indirect disclosure of filer-specific data. The Commission has noted, however, that increased public access to disaggregated subscription data could have significant benefits.⁸⁶ We believe that these benefits may outweigh any confidentiality interests for some disaggregated subscription data. In particular, we believe that making public the number of subscribers at each reported speed on a national level would provide a meaningful metric of the state of broadband adoption in the U.S. Although this change would not involve expressly identifying the specific filers submitting the information, it might be possible to infer with reasonable certainty the provider or providers reporting subscribers at higher speeds, for which fewer providers offer service. We believe however, that any competitive harm to the affected providers is likely to be slight, because the numbers would be aggregated to the national level and similar information is routinely made public by these entities through the Securities and Exchange Commission (SEC) and other disclosures. We seek comment on whether disclosure of this information would be beneficial and, if so, whether any measures are necessary to ensure that the interests of the filers are protected.

54. *Release of Disaggregated Subscriber Data.* As another avenue for realizing the potential benefits of greater public access to subscription data, we seek comment on whether certain types of disaggregated subscriber data should be made public after a certain period of time has passed. We believe that, over time, the potential for competitive harm from the release of filer-specific subscription data likely diminishes. We seek comment on whether this is the case in connection with specific types of subscriber information collected on Form 477 and, if so, what period of time provides adequate protection from harm for each. What factors should be weighed in determining which categories of raw data files to

(Continued from previous page) _____
[speeds-compared-to-home-network/](#) (last visited July 31, 2017) (reporting 4G LTE download speeds between 5 and 12 Mbps).

⁸³ 2013 Form 477 Order, 28 FCC Rcd at 9923, para. 82.

⁸⁴ *Id.*

⁸⁵ See, e.g., 2000 Local Competition and Broadband Reporting Order, 15 FCC Rcd at 7760 para. 91.

⁸⁶ 2013 Form 477 Order, 28 FCC Rcd at 9920-22, paras. 78-79.

release? What would be the public interest and legal justifications for releasing or not releasing different types of raw data files?

55. *Other data.* We also seek comment on whether there are other Form 477 data that the Commission should consider making public. While we understand confidentiality concerns associated with making aspects of these data public, there are also significant potential benefits to consumers and public policy. We invite comment on what data should be made publicly available, and how to mitigate competitive and other concerns.

2. Filing Frequency

56. Form 477 is currently a semi-annual collection. In the *2011 Form 477 NPRM*, the Commission sought comment on other time frames, and on different time frames for providers based upon size, but did not address those issues in the *2013 Report and Order*.⁸⁷ We seek to refresh the record on whether we should shift to an annual collection for all filers, for certain filers (such as smaller filers), or for certain parts of the form. Are there some types of data (e.g., the speed of fixed-broadband-deployment subscriptions, or the coverage of mobile broadband deployment) that change so quickly that an annual filing would obscure significant developments that should be captured by our reports? We specifically seek comment on the potential impacts of switching to annual, instead of semi-annual, reporting for all Form 477 filers, both in terms of the utility of the data collected and the burden on filers. While the overall burden associated with Form 477 likely would decrease by switching to annual filing, we seek comment on whether the per-round burden on an annual basis would increase to some degree and whether this would be manageable. We seek comment on whether it is more efficient for a filer's employees to undertake this collection once a year given employee turnover and the greater amount of change to the data on an annual basis compared to a more routine semi-annual filing with a smaller amount of change to the data.

57. We also seek comment on whether collecting on a twelve-month cycle would render the data less useful for our purposes, given the rate of broadband deployment and uptake, particularly at higher speeds, industrywide. For example, how would an annual collection affect Commission policymaking? Would it be more difficult to analyze industry trends—such as competition, entry/expansion, adoption of newer technologies and faster speeds—with only annual data? On a one-year cycle, the most recently filed data available for analysis may be up to six months older than it is now. Would the lack of more recent data unduly impair our ability to carry out transaction review effectively or generate comprehensive and up-to-date Broadband Progress reports?

3. Availability of Form 477 Data

58. As part of our examination of the Form 477 collection, we also seek input on how we make the Form 477 data available to the public and stakeholders. How would the proposals described in this FNPRM affect the Commission's ability to process the data and make them available? Given current data and the proposals above, what approach should the Commission take with regard to the National Broadband Map (NBM) (www.broadbandmap.gov)?⁸⁸ The Commission currently maintains access to the NBM, which relies on data collected by the National Telecommunications and Information Administration via the State Broadband Initiative (SBI) for data as of June, 2014.⁸⁹ In addition, the

⁸⁷ *2011 Form 477 NPRM*, FCC Rcd at 1526-27, para. 46.

⁸⁸ The initial NBM was created pursuant to Section 6001(l) of the American Recovery and Reinvestment Act of 2009 (47 U.S.C. § 1305). That provision required NTIA to develop and maintain a comprehensive nationwide inventory map of the existing broadband service capability and availability in the United States that depicts the geographic extent to which broadband service capability is deployed and available from a commercial provider or public provider throughout each State. Pursuant to an interagency agreement, NTIA and the FCC made an interactive and searchable map available on www.broadbandmap.gov on February 17, 2011.

⁸⁹ Earlier data sets remain available for download at <http://www2.ntia.doc.gov/broadband-data>. NTIA, *National Broadband Map Datasets*, <http://www2.ntia.doc.gov/broadband-data> (last visited July 31, 2017).

Commission makes a number of maps available to help visualize more recent Form 477 data⁹⁰ and makes Form 477 data available for download in various formats.⁹¹ We believe that a searchable national map of the most recently available Form 477 broadband deployment data can have significant value for the public, industry, researchers and others. Such a map could also provide significant support for our own efforts in tracking broadband. We therefore seek input on whether, and how, we can use the Form 477 data most effectively to update the NBM.⁹²

IV. PROCEDURAL MATTERS

A. Initial Regulatory Flexibility Analysis

59. As required by the Regulatory Flexibility Act of 1980 (RFA),⁹³ the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) for this *Notice of Proposed Rulemaking*, of the possible significant economic impact on small entities of the policies and rules addressed in this document. The IRFA is set forth in Appendix A. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed on or before the dates on the first page of this *Notice of Proposed Rulemaking*. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this *Notice of Proposed Rulemaking*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).⁹⁴

B. Initial Paperwork Reduction Act Analysis

60. This document contains proposed modified information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget ("OMB") to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. § 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

⁹⁰ Commission maps are available at <https://www.fcc.gov/maps/>. FCC, *Maps*, <https://www.fcc.gov/maps/> (last visited July 26, 2017). A searchable map of fixed-broadband deployment data as of June 2016 is currently available at <https://www.fcc.gov/maps/fixed-broadband-deployment-data/>. FCC, *Deployment: Fixed Broadband (25 Mbps/3Mbps) as of June 2016*, <https://www.fcc.gov/maps/fixed-broadband-deployment-data/>. A map of fixed-broadband subscription data is available at <https://www.fcc.gov/maps/residential-fixed-internet-access-service-connections-per-1000-households-by-census-tract/>. FCC, *Residential Fixed Internet Access Service Connections per 1000 Households by Census Tract As of June 2016*, <https://www.fcc.gov/maps/residential-fixed-internet-access-service-connections-per-1000-households-by-census-tract/> (last visited July 26, 2017). Mobile deployment data are currently available on a number of maps including <https://www.fcc.gov/maps/lte-coverage-number-providers-ye-2015/> FCC, *LTE Coverage by Number of Providers—YE 2015*, <https://www.fcc.gov/maps/lte-coverage-number-providers-ye-2015/> (last visited July 26, 2017).

⁹¹ Fixed data are available for download at <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>. FCC, *Fixed Broadband Deployment Data from FCC Form 477*, <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>, (last visited July 31, 2017). Mobile data are available for download at <https://www.fcc.gov/mobile-deployment-form-477-data> FCC, *Mobile Deployment Form 477 Data*, <https://www.fcc.gov/mobile-deployment-form-477-data> (last visited July 31, 2017).

⁹² We note that the existing version of the NBM relies on the speed tiers in use in the SBI data collection (e.g., data capture that broadband is available between 10 and 25 Mbps download rather than providing the specific download speed); and in some functions only offers information about a limited set of speeds (e.g., the rank function will only provide information about broadband that meets or exceeds 768 kbps/200 kbps or 3 Mbps/768 kbps). In addition, the NBM generally provides information about wireless (including fixed wireless) and wired technologies; and does not include information about satellite broadband.

⁹³ 5 U.S.C. § 603.

⁹⁴ 5 U.S.C. § 603(a).

C. Other Procedural Matters

1. *Ex Parte* Rules – Permit-But-Disclose

61. The proceeding this NPRM initiates shall be treated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.⁹⁵ Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter’s written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission’s *ex parte* rules.

2. Comment Filing Procedures

62. Pursuant to sections 1.415 and 1.419 of the Commission’s rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission’s Electronic Comment Filing System (“ECFS”). See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <https://www.fcc.gov/ecfs/>
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission’s Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission’s Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

⁹⁵ 47 CFR §§ 1.1200 *et seq.*

63. *Availability of Documents.* Comments, reply comments, and *ex parte* submissions will be publicly available online via ECFS.⁹⁶ These documents will also be available for public inspection during regular business hours in the FCC Reference Information Center, which is located in Room CY-A257 at FCC Headquarters, 445 12th Street, SW, Washington, DC 20554. The Reference Information Center is open to the public Monday through Thursday from 8:00 a.m. to 4:30 p.m. and Friday from 8:00 a.m. to 11:30 a.m.

64. *People with Disabilities.* To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

V. ORDERING CLAUSES

65. Accordingly, IT IS ORDERED that, pursuant to sections 4(i), 201(b), 214, 218-220, 251-252, 254, 303(r), 310, 332, 403, and 706 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 201(b), 214, 218-220, 251-252, 254, 303(r), 310, 332, 403, and 1302 this Further Notice of Proposed Rulemaking IS ADOPTED.

66. IT IS FURTHER ORDERED that the Commission's Consumer & Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Further Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

⁹⁶ Documents will generally be available electronically in ASCII, Microsoft Word, and/or Adobe Acrobat.

APPENDIX

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ the Commission has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this *Further Notice of Proposed Rulemaking (FNPRM)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *FNPRM* provided on the first page of the *FNPRM*. The Commission will send a copy of the *FNPRM*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).² In addition, the *FNPRM* and IRFA (or summaries thereof) will be published in the Federal Register.³

A. Need for, and Objectives of, the Proposed Rules

2. With this *FNPRM*, the Commission initiates a further proceeding to examine the effectiveness of the Commission's Form 477—the principal tool used by the Commission to gather data on communications services, including broadband services, to help inform our policymaking. In establishing Form 477, the Commission envisioned that the data collected would help it better assess the availability of broadband services, such as high-speed Internet access service, and the development of competition for local telephone service, materially improving its policymaking in those areas. From the outset, the Commission sought to minimize the burden the collection requirements would impose on filers. Our goal in this *FNPRM* is to eliminate the collection of certain information on Form 477 that we believe is not sufficiently useful when compared with the burden imposed on filers in providing it and to explore how we can revise other aspects of the data collection to increase its usefulness to the Commission, Congress, the industry, and the public. These steps continue the Commission's efforts since the creation of Form 477 to identify and eliminate unnecessary or overly-burdensome filing requirements while improving the value of the data we continue to collect. This *FNPRM* proposes several ways to streamline the information collected in Form 477 as well as suggests ways to ensure Form 477 data are as accurate and reliable as possible.

B. Legal Basis

3. The legal basis for any action that may be taken pursuant to the *FNPRM* is contained in sections 3, 10, 201(b), 230, 254(e), 303(r), and 332 of the Communications Act of 1934, as amended 47 U.S.C. §§ 153, 160, 201(b), 254(e), 303(r), 332.

C. Description and Estimate of the Number of Small Entities to Which the Rules Would Apply

4. The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.⁴ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”⁵ In addition, the term “small business” has the

¹ See 5 U.S.C. § 603. The RFA, see 5 U.S.C. §§ 601-12, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See 5 U.S.C. § 603(a).

³ See *id.*

⁴ See 5 U.S.C. § 603(b)(3).

⁵ See 5 U.S.C. § 601(6).

same meaning as the term “small-business concern” under the Small Business Act.⁶ A small-business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.⁷

1. Total Small Entities

5. *Small Businesses, Small Organizations, Small Governmental Jurisdictions.* Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive small entity size standards that could be directly affected herein.⁸ First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA’s Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.⁹ These types of small businesses represent 99.9% of all businesses in the United States which translates to 28.8 million businesses.¹⁰ Next, the type of small entity described as a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹¹ Nationwide, as of 2007, there were approximately 1,621,215 small organizations.¹² Finally, the small entity described as a “small governmental jurisdiction” is defined generally as “governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹³ U.S. Census Bureau data published in 2012 indicate that there were 89,476 local governmental jurisdictions in the United States.¹⁴ We estimate that, of this total, as many as 88,761 entities may qualify as “small governmental jurisdictions.”¹⁵ Thus, we estimate that most governmental jurisdictions are small.

2. Broadband Internet Access Service Providers

6. The broadband Internet access service provider industry has changed since the definition was introduced in 2007. The data cited below may therefore include entities that no longer provide broadband Internet access service, and may exclude entities that now provide such service. To ensure that

⁶ 5 U.S.C. § 601(3) (incorporating by reference the definition of “small-business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

⁷ See 15 U.S.C. § 632.

⁸ See 5 U.S.C. § 601(3)-(6).

⁹ See SBA, Office of Advocacy, “Frequently Asked Questions, Question 1 – What is a small business?” https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf (June 2016).

¹⁰ See SBA, Office of Advocacy, “Frequently Asked Questions, Question 2- How many small businesses are there in the U.S.?” https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf (June 2016).

¹¹ 5 U.S.C. § 601(4).

¹² Independent Sector, *The New Nonprofit Almanac & Desk Reference* (2010).

¹³ 5 U.S.C. § 601(5).

¹⁴ U.S. Census Bureau, *Statistical Abstract of the United States: 2012* at 267, Table 428 (2011), <http://www2.census.gov/library/publications/2011/compendia/statab/131ed/2012-statab.pdf> (citing data from 2007).

¹⁵ The 2012 U.S. Census Bureau data for small governmental organizations are not presented based on the size of the population in each organization. There were 89,476 local governmental organizations in the Census Bureau data for 2012, which is based on 2007 data. As a basis of estimating how many of these 89,476 local government organizations were small, we note that there were a total of 715 cities and towns (incorporated places and minor civil divisions) with populations over 50,000 in 2011. See U.S. Census Bureau, *City and Town Totals Vintage: 2011*, <http://www.census.gov/popest/data/cities/totals/2011/index.html>. If we subtract the 715 cities and towns that meet or exceed the 50,000-population threshold, we conclude that approximately 88,761 are small.

this IRFA describes the universe of small entities that our action might affect, we discuss in turn several different types of entities that might be providing broadband Internet access service. We note that, although we have no specific information on the number of small entities that provide broadband Internet access service over unlicensed spectrum, we include these entities in our Initial Regulatory Flexibility Analysis.

7. *Internet Service Providers (Broadband)*. Broadband Internet service providers includes wired (e.g., cable, DSL) and VoIP service providers using their own operated wired telecommunications infrastructure fall in the category of Wired Telecommunication Carriers.¹⁶ Wired Telecommunications Carriers comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.¹⁷ The SBA size standard for this category classifies a business as small if it has 1,500 or fewer employees.¹⁸ U.S. Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees.¹⁹ Consequently, under this size standard the majority of firms in this industry can be considered small.

8. *Internet Service Providers (Non-Broadband)*. Internet access service providers such as Dial-up Internet service providers, VoIP service providers using client-supplied telecommunications connections and Internet service providers using client-supplied telecommunications connections (e.g., dial-up ISPs) fall in the category of All Other Telecommunications. The SBA has developed a small business size standard for All Other Telecommunications which consists of all such firms with gross annual receipts of \$32.5 million or less.²⁰ For this category, U.S. Census data for 2012 shows that there were 1,442 firms that operated for the entire year. Of these firms, a total of 1,400 had gross annual receipts of less than \$25 million.²¹ Consequently, under this size standard a majority of “All Other Telecommunications” firms can be considered small.

3. Wireline Providers

9. *Wired Telecommunications Carriers*. The U.S. Census Bureau defines this industry as “establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired communications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services, wired (cable) audio and video programming distribution, and wired broadband internet services. By exception, establishments providing satellite television distribution services using facilities

¹⁶ See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

¹⁷ *Id.*

¹⁸ *Id.*

¹⁹ U.S. Census Bureau, *Estab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodType=table.

²⁰ 13 CFR § 121.201; NAICS Code 517919.

²¹ U.S. Census Bureau, *Estab & Firm Size: Receipts Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ4&prodType=table.

and infrastructure that they operate are included in this industry.”²² The SBA has developed a small business size standard for Wired Telecommunications Carriers, which consists of all such companies having 1,500 or fewer employees.²³ U.S. Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees.²⁴ Thus, under this size standard, the majority of firms in this industry can be considered small.

10. *Local Exchange Carriers (LECs)*. Neither the Commission nor the SBA has developed a size standard for small businesses specifically applicable to local exchange services. The closest applicable NAICS Code category is Wired Telecommunications Carriers and under the applicable SBA size standard, such a business is small if it has 1,500 or fewer employees.²⁵ According to Commission data, U.S. Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees.²⁶ The Commission therefore estimates that most providers of local exchange carrier service are small entities that may be affected by the rules adopted.

11. *Incumbent LECs*. Neither the Commission nor the SBA has developed a small business size standard specifically for incumbent local exchange services. The closest applicable NAICS Code category is Wired Telecommunications Carriers and under that size standard, such a business is small if it has 1,500 or fewer employees.²⁷ According to U.S. Census data for 2012, 3,117 firms operated in that year. Of this total, 3,083 operated with fewer than 1,000 employees.²⁸ Consequently, the Commission estimates that most providers of incumbent local exchange service are small businesses that may be affected by the rules and policies adopted. According to Commission data, one thousand three hundred and seven (1,307) Incumbent Local Exchange Carriers reported that they were incumbent local exchange service providers.²⁹ Of this total, an estimated 1,006 have 1,500 or fewer employees.³⁰ Thus using the SBA’s size standard the majority of Incumbent LECs can be considered small entities.

²² See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

²³ See 13 CFR § 120.201, NAICS Code 517110.

²⁴ U.S. Census Bureau, *Etab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodType=table.

²⁵ See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

²⁶ U.S. Census Bureau, *Etab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ5&prodType=table.

²⁷ The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

²⁸ U.S. Census Bureau, *Etab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ5&prodType=table.

²⁹ See *Trends in Telephone Service*, Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division at Table 5.3 (Sept. 2010) (*Trends in Telephone Service*).

³⁰ *Id.*

12. *Competitive Local Exchange Carriers (Competitive LECs), Competitive Access Providers (CAPs), Shared-Tenant Service Providers, and Other Local Service Providers.* Neither the Commission nor the SBA has developed a small business size standard specifically for these service providers. The appropriate NAICS Code category is Wired Telecommunications Carriers and under that size standard, such a business is small if it has 1,500 or fewer employees.³¹ U.S. Census data for 2012 indicate that 3,117 firms operated during that year. Of that number, 3,083 operated with fewer than 1,000 employees.³² Based on these data, the Commission concludes that the majority of Competitive LECs, CAPs, Shared-Tenant Service Providers, and Other Local Service Providers, are small entities. According to Commission data, 1,442 carriers reported that they were engaged in the provision of either competitive local exchange services or competitive access provider services.³³ Of these 1,442 carriers, an estimated 1,256 have 1,500 or fewer employees.³⁴ In addition, 17 carriers have reported that they are Shared-Tenant Service Providers, and all 17 are estimated to have 1,500 or fewer employees.³⁵ Also, 72 carriers have reported that they are Other Local Service Providers.³⁶ Of this total, 70 have 1,500 or fewer employees.³⁷ Consequently, based on internally researched FCC data, the Commission estimates that most providers of competitive local exchange service, competitive access providers, Shared-Tenant Service Providers, and Other Local Service Providers are small entities.³⁸

13. *Interexchange Carriers (IXCs).* Neither the Commission nor the SBA has developed a definition for Interexchange Carriers. The closest NAICS Code category is Wired Telecommunications Carriers and the applicable size standard under SBA rules consists of all such companies having 1,500 or fewer employees.³⁹ U.S. Census data for 2012 indicate that 3,117 firms operated during that year. Of that number, 3,083 operated with fewer than 1,000 employees.⁴⁰ According to internally developed Commission data, 359 companies reported that their primary telecommunications service activity was the

³¹ See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

³² U.S. Census Bureau, *Estab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_af=ECN_2012_US_51SSSZ5&prodType=table.

³³ See *Trends in Telephone Service*, at tbl. 5.3.

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.*

³⁸ We have included small incumbent LECs in this present RFA analysis. As noted above, a “small business” under the RFA is one that, *inter alia*, meets the pertinent small business size standard (e.g., a telephone communications business having 1,500 or fewer employees), and “is not dominant in its field of operation.”³⁸ The SBA’s Office of Advocacy contends that, for RFA purposes, small incumbent LECs are not dominant in their field of operation because any such dominance is not “national” in scope.³⁸ We have therefore included small incumbent LECs in this RFA analysis, although we emphasize that this RFA action has no effect on Commission analyses and determinations in other, non-RFA contexts.

³⁹ See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

⁴⁰ U.S. Census Bureau, *Estab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_af=ECN_2012_US_51SSSZ5&prodType=table.

provision of interexchange services.⁴¹ Of this total, an estimated 317 have 1,500 or fewer employees.⁴² Consequently, the Commission estimates that the majority of interexchange service providers are small entities that may be affected by the rules proposed.

14. *Operator Service Providers (OSPs)*. Neither the Commission nor the SBA has developed a small business size standard specifically for operator service providers. The closest applicable size standard under SBA rules is the category of Wired Telecommunications Carriers. Under the size standard for Wired Telecommunications Carriers such a business is small if it has 1,500 or fewer employees.⁴³ U.S. Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees.⁴⁴ Thus, under this size standard, the majority of firms in this industry can be considered small.

15. According to Commission data, 33 carriers have reported that they are engaged in the provision of operator services.⁴⁵ Of these, an estimated 31 have 1,500 or fewer employees and two have more than 1,500 employees.⁴⁶ Consequently, the Commission estimates that the majority of OSPs are small entities that may be affected by the rules proposed.

16. *Other Toll Carriers*. Neither the Commission nor the SBA has developed a definition for small businesses specifically applicable to Other Toll Carriers. This category includes toll carriers that do not fall within the categories of interexchange carriers, operator service providers, prepaid calling card providers, satellite service carriers, or toll resellers. The closest applicable size standard under SBA rules is for Wired Telecommunications Carriers and the applicable small business size standard under SBA rules consists of all such companies having 1,500 or fewer employees.⁴⁷ U.S. Census data for 2012 indicate that 3,117 firms operated during that year. Of that number, 3,083 operated with fewer than 1,000 employees.⁴⁸ According to Commission data, 284 companies reported that their primary telecommunications service activity was the provision of other toll carriage.⁴⁹ Of these, an estimated 279 have 1,500 or fewer employees.⁵⁰ Consequently, the Commission estimates that most Other Toll Carriers are small entities that may be affected by the rules proposed.

⁴¹ See *Trends in Telephone Service*, at tbl. 5.3.

⁴² *Id.*

⁴³ See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

⁴⁴ U.S. Census Bureau, *Estab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ2&prodType=table.

⁴⁵ See *Trends in Telephone Service*, Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division at Table 5.3 (Sept. 2010) (*Trends in Telephone Service*).

⁴⁶ *Trends in Telephone Service*, tbl. 5.3.

⁴⁷ See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, U.S. Census Bureau, *2017 NAICS Definition*, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

⁴⁸ U.S. Census Bureau, *Estab & Firm Size: Employment Size of Firms for the U.S. 2012*, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ5&prodType=table.

⁴⁹ *Trends in Telephone Service*, at tbl. 5.3.

⁵⁰ *Id.*

4. Wireless Providers – Fixed and Mobile

17. The broadband Internet access service provider category covered by these proposed rules may cover multiple wireless firms and categories of regulated wireless services. Thus, to the extent the wireless services listed below are used by wireless firms for broadband Internet access service, the proposed actions may have an impact on those small businesses as set forth above and further below. In addition, for those services subject to auctions, we note that, as a general matter, the number of winning bidders that claim to qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Also, the Commission does not generally track subsequent business size unless, in the context of assignments and transfers or reportable eligibility events, unjust enrichment issues are implicated.

18. *Wireless Telecommunications Carriers (except Satellite)*. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and wireless video services.⁵¹ The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.⁵² For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year.⁵³ Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.⁵⁴ Thus under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

19. The Commission's own data—available in its Universal Licensing System—indicate that, as of October 25, 2016, there are 280 Cellular licensees that will be affected by our actions today.⁵⁵ The Commission does not know how many of these licensees are small, as the Commission does not collect that information for these types of entities. Similarly, according to internally developed Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, Personal Communications Service, and Specialized Mobile Radio Telephony services.⁵⁶ Of this total, an estimated 261 have 1,500 or fewer employees, and 152 have more than 1,500 employees.⁵⁷ Thus, using available data, we estimate that the majority of wireless firms can be considered small.

20. *Wireless Communications Services*. This service can be used for fixed, mobile, radiolocation, and digital audio broadcasting satellite uses. The Commission defined “small business” for the wireless communications services (WCS) auction as an entity with average gross revenues of \$40 million for each of the three preceding years, and a “very small business” as an entity with average gross

⁵¹ NAICS Code 517210. See U.S. Census Bureau, *Description*, <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en/ECN.NAICS2012.517210>.

⁵² 13 CFR § 121.201, NAICS code 517210.

⁵³ U.S. Census Bureau, Subject Series: Information, Table 5, “Establishment and Firm Size: Employment Size of Firms for the U.S.: 2012 NAICS Code 517210” (rel. Jan. 8, 2016).

⁵⁴ *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

⁵⁵ See FCC, Universal Licensing System, <http://wireless.fcc.gov/uls>. For the purposes of this IRFA, consistent with Commission practice for wireless services, the Commission estimates the number of licensees based on the number of unique FCC Registration Numbers.

⁵⁶ See Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division, Trends in Telephone Service at Table 5.3 (Sept. 2010) (*Trends in Telephone Service*), https://apps.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf.

⁵⁷ See *id.*

revenues of \$15 million for each of the three preceding years.⁵⁸ The SBA has approved these small business size standards.⁵⁹ In the Commission's auction for geographic area licenses in the WCS there were seven winning bidders that qualified as "very small business" entities, and one that qualified as a "small business" entity.

21. *1670–1675 MHz Services.* This service can be used for fixed and mobile uses, except aeronautical mobile.⁶⁰ An auction for one license in the 1670–1675 MHz band was conducted in 2003. One license was awarded. The winning bidder was not a small entity.

22. *Wireless Telephony.* Wireless telephony includes cellular, personal communications services, and specialized mobile radio telephony carriers. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite)⁶¹ and the appropriate size standard for this category under the SBA rules is that such a business is small if it has 1,500 or fewer employees.⁶² For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year. Of this total, 955 firms had fewer than 1,000 employees and 12 firms has 1000 employees or more.⁶³ Thus under this category and the associated size standard, the Commission estimates that a majority of these entities can be considered small. According to Commission data, 413 carriers reported that they were engaged in wireless telephony.⁶⁴ Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than 1,500 employees.⁶⁵ Therefore, more than half of these entities can be considered small.

23. *Broadband Personal Communications Service.* The broadband personal communications services (PCS) spectrum is divided into six frequency blocks designated A through F, and the Commission has held auctions for each block. The Commission initially defined a "small business" for C- and F-Block licenses as an entity that has average gross revenues of \$40 million or less in the three previous calendar years.⁶⁶ For F-Block licenses, an additional small business size standard for "very small business" was added and is defined as an entity that, together with its affiliates, has average gross revenues of not more than \$15 million for the preceding three calendar years.⁶⁷ These standards defining "small entity" in the context of broadband PCS auctions, have been approved by the SBA.⁶⁸ No small businesses within the SBA-approved small business size standards bid successfully for licenses in Blocks A and B. There were 90 winning bidders that claimed small business status in the first two C-Block auctions. A total of 93 bidders that claimed small business status won approximately 40 percent of the

⁵⁸ *Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS)*, Report and Order, 12 FCC Rcd 10785, 10879, para. 194 (1997).

⁵⁹ See Letter from Aida Alvarez, Administrator, SBA, to Amy Zoslov, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, FCC (filed Dec. 2, 1998) (*Alvarez Letter 1998*).

⁶⁰ 47 CFR § 2.106; see generally 47 CFR §§ 27.1-27.70.

⁶¹ 13 CFR § 121.201, NAICS code 517210.

⁶² *Id.*

⁶³ *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

⁶⁴ *Trends in Telephone Service*, tbl. 5.3.

⁶⁵ *Id.*

⁶⁶ See *Amendment of Parts 20 and 24 of the Commission's Rules – Broadband PCS Competitive Bidding and the Commercial Mobile Radio Service Spectrum Cap; Amendment of the Commission's Cellular/PCS Cross-Ownership Rule*, Report and Order, 11 FCC Rcd 7824, 7850-52, paras. 57-60 (1996) (*PCS Report and Order*); see also 47 CFR § 24.720(b).

⁶⁷ See *PCS Report and Order*, 11 FCC Rcd at 7852, para. 60.

⁶⁸ See *Alvarez Letter 1998*.

1,479 licenses in the first auction for the D, E, and F Blocks.⁶⁹ On April 15, 1999, the Commission completed the reauction of 347 C-, D-, E-, and F-Block licenses in Auction No. 22.⁷⁰ Of the 57 winning bidders in that auction, 48 claimed small business status and won 277 licenses.

24. On January 26, 2001, the Commission completed the auction of 422 C and F Block Broadband PCS licenses in Auction No. 35. Of the 35 winning bidders in that auction, 29 claimed small business status. Subsequent events concerning Auction 35, including judicial and agency determinations, resulted in a total of 163 C and F Block licenses being available for grant. On February 15, 2005, the Commission completed an auction of 242 C-, D-, E-, and F-Block licenses in Auction No. 58. Of the 24 winning bidders in that auction, 16 claimed small business status and won 156 licenses. On May 21, 2007, the Commission completed an auction of 33 licenses in the A, C, and F Blocks in Auction No. 71. Of the 12 winning bidders in that auction, five claimed small business status and won 18 licenses. On August 20, 2008, the Commission completed the auction of 20 C-, D-, E-, and F-Block Broadband PCS licenses in Auction No. 78. Of the eight winning bidders for Broadband PCS licenses in that auction, six claimed small business status and won 14 licenses.

25. *Specialized Mobile Radio Licenses.* The Commission awards “small entity” bidding credits in auctions for Specialized Mobile Radio (SMR) geographic area licenses in the 800 MHz and 900 MHz bands to firms that had revenues of no more than \$15 million in each of the three previous calendar years.⁷¹ The Commission awards “very small entity” bidding credits to firms that had revenues of no more than \$3 million in each of the three previous calendar years.⁷² The SBA has approved these small business size standards for the 900 MHz Service.⁷³ The Commission has held auctions for geographic area licenses in the 800 MHz and 900 MHz bands. The 900 MHz SMR auction began on December 5, 1995, and closed on April 15, 1996. Sixty bidders claiming that they qualified as small businesses under the \$15 million size standard won 263 geographic area licenses in the 900 MHz SMR band. The 800 MHz SMR auction for the upper 200 channels began on October 28, 1997, and was completed on December 8, 1997. Ten bidders claiming that they qualified as small businesses under the \$15 million size standard won 38 geographic area licenses for the upper 200 channels in the 800 MHz SMR band.⁷⁴ A second auction for the 800 MHz band conducted in 2002 and included 23 BEA licenses. One bidder claiming small business status won five licenses.⁷⁵

26. The auction of the 1,053 800 MHz SMR geographic area licenses for the General Category channels was conducted in 2000. Eleven bidders won 108 geographic area licenses for the General Category channels in the 800 MHz SMR band and qualified as small businesses under the \$15 million size standard.⁷⁶ In an auction completed in 2000, a total of 2,800 Economic Area licenses in the

⁶⁹ See *Broadband PCS, D, E and F Block Auction Closes*, Public Notice, Doc. No. 89838 (rel. Jan. 14, 1997).

⁷⁰ See *C, D, E, and F Block Broadband PCS Auction Closes*, Public Notice, 14 FCC Rcd 6688 (WTB 1999). Before Auction No. 22, the Commission established a very small standard for the C Block to match the standard used for F Block. *Amendment of the Commission’s Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees*, Fourth Report and Order, 13 FCC Rcd 15743, 15768, para. 46 (1998).

⁷¹ 47 CFR § 90.814(b)(1).

⁷² *Id.*

⁷³ See Letter from Aida Alvarez, Administrator, SBA, to Thomas Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission (filed Aug. 10, 1999) (*Alvarez Letter 1999*).

⁷⁴ See *Correction to Public Notice DA 96-586 “FCC Announces Winning Bidders in the Auction of 1020 Licenses to Provide 900 MHz SMR in Major Trading Areas,”* Public Notice, 18 FCC Rcd 18367 (WTB 1996).

⁷⁵ See *Multi-Radio Service Auction Closes*, Public Notice, 17 FCC Rcd 1446 (WTB 2002).

⁷⁶ See *800 MHz Specialized Mobile Radio (SMR) Service General Category (851–854 MHz) and Upper Band (861–865 MHz) Auction Closes; Winning Bidders Announced*, Public Notice, 15 FCC Rcd 17162 (2000).

lower 80 channels of the 800 MHz SMR service were awarded.⁷⁷ Of the 22 winning bidders, 19 claimed small business status and won 129 licenses. Thus, combining all four auctions, 41 winning bidders for geographic licenses in the 800 MHz SMR band claimed status as small businesses.

27. In addition, there are numerous incumbent site-by-site SMR licenses and licensees with extended implementation authorizations in the 800 and 900 MHz bands. We do not know how many firms provide 800 MHz or 900 MHz geographic area SMR service pursuant to extended implementation authorizations, nor how many of these providers have annual revenues of no more than \$15 million. One firm has over \$15 million in revenues. In addition, we do not know how many of these firms have 1,500 or fewer employees, which is the SBA-determined size standard.⁷⁸ We assume, for purposes of this analysis, that all of the remaining extended implementation authorizations are held by small entities, as defined by the SBA.

28. *Lower 700 MHz Band Licenses.* The Commission previously adopted criteria for defining three groups of small businesses for purposes of determining their eligibility for special provisions such as bidding credits.⁷⁹ The Commission defined a “small business” as an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding \$40 million for the preceding three years.⁸⁰ A “very small business” is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$15 million for the preceding three years.⁸¹ Additionally, the lower 700 MHz Service had a third category of small business status for Metropolitan/Rural Service Area (MSA/RSA) licenses—“entrepreneur”—which is defined as an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$3 million for the preceding three years.⁸² The SBA approved these small size standards.⁸³ An auction of 740 licenses (one license in each of the 734 MSAs/RSAs and one license in each of the six Economic Area Groupings (EAGs)) commenced on August 27, 2002, and closed on September 18, 2002. Of the 740 licenses available for auction, 484 licenses were won by 102 winning bidders. Seventy-two of the winning bidders claimed small business, very small business or entrepreneur status and won a total of 329 licenses.⁸⁴ A second auction commenced on May 28, 2003, closed on June 13, 2003, and included 256 licenses: 5 EAG licenses and 476 Cellular Market Area licenses.⁸⁵ Seventeen winning bidders claimed small or very small business status and won 60 licenses, and nine winning bidders claimed entrepreneur status and won 154 licenses.⁸⁶ On July 26, 2005, the Commission completed an auction of 5 licenses in the Lower 700 MHz band (Auction No. 60). There were three winning bidders for five licenses. All three winning bidders claimed small business status.

⁷⁷ See *800 MHz SMR Service Lower 80 Channels Auction Closes; Winning Bidders Announced*, Public Notice, 16 FCC Rcd 1736 (2000).

⁷⁸ See generally 13 CFR § 121.201, NAICS code 517210.

⁷⁹ See *Reallocation and Service Rules for the 698–746 MHz Spectrum Band (Television Channels 52–59)*, Report and Order, 17 FCC Rcd 1022 (2002) (*Channels 52–59 Report and Order*).

⁸⁰ See *id.* at 1087–88, para. 172.

⁸¹ See *id.*

⁸² See *id.*, at 1088, para. 173.

⁸³ See *Alvarez Letter 1999*.

⁸⁴ See *Lower 700 MHz Band Auction Closes*, Public Notice, 17 FCC Rcd 17272 (WTB 2002).

⁸⁵ See *id.*

⁸⁶ See *id.*

29. In 2007, the Commission reexamined its rules governing the 700 MHz band in the *700 MHz Second Report and Order*.⁸⁷ An auction of 700 MHz licenses commenced January 24, 2008 and closed on March 18, 2008, which included, 176 Economic Area licenses in the A Block, 734 Cellular Market Area licenses in the B Block, and 176 EA licenses in the E Block.⁸⁸ Twenty winning bidders, claiming small business status (those with attributable average annual gross revenues that exceed \$15 million and do not exceed \$40 million for the preceding three years) won 49 licenses. Thirty-three winning bidders claiming very small business status (those with attributable average annual gross revenues that do not exceed \$15 million for the preceding three years) won 325 licenses.

30. *Upper 700 MHz Band Licenses*. In the *700 MHz Second Report and Order*, the Commission revised its rules regarding Upper 700 MHz licenses.⁸⁹ On January 24, 2008, the Commission commenced Auction 73 in which several licenses in the Upper 700 MHz band were available for licensing: 12 Regional Economic Area Grouping licenses in the C Block, and one nationwide license in the D Block.⁹⁰ The auction concluded on March 18, 2008, with 3 winning bidders claiming very small business status (those with attributable average annual gross revenues that do not exceed \$15 million for the preceding three years) and winning five licenses.

31. *700 MHz Guard Band Licensees*. In 2000, in the *700 MHz Guard Band Order*, the Commission adopted size standards for “small businesses” and “very small businesses” for purposes of determining their eligibility for special provisions such as bidding credits and installment payments.⁹¹ A small business in this service is an entity that, together with its affiliates and controlling principals, has average gross revenues not exceeding \$40 million for the preceding three years.⁹² Additionally, a very small business is an entity that, together with its affiliates and controlling principals, has average gross revenues that are not more than \$15 million for the preceding three years.⁹³ SBA approval of these definitions is not required.⁹⁴ An auction of 52 Major Economic Area licenses commenced on September 6, 2000, and closed on September 21, 2000.⁹⁵ Of the 104 licenses auctioned, 96 licenses were sold to nine bidders. Five of these bidders were small businesses that won a total of 26 licenses. A second auction of 700 MHz Guard Band licenses commenced on February 13, 2001, and closed on February 21, 2001. All

⁸⁷ *Service Rules for the 698–746, 747–762 and 777–792 MHz Band; Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems; Section 68.4(a) of the Commission’s Rules Governing Hearing Aid-Compatible Telephones; Biennial Regulatory Review—Amendment of Parts 1, 22, 24, 27, and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services; Former Nextel Communications, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the Commission’s Rules; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band; Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010; Declaratory Ruling on Reporting Requirement under Commission’s Part 1 Anti-Collusion Rule*, Second Report and Order, 22 FCC Rcd 15289, 15359 n. 434 (2007) (*700 MHz Second Report and Order*).

⁸⁸ *See Auction of 700 MHz Band Licenses Closes*, Public Notice, 23 FCC Rcd 4572 (WTB 2008).

⁸⁹ *700 MHz Second Report and Order*, 22 FCC Rcd 15289.

⁹⁰ *See Auction of 700 MHz Band Licenses Closes*, Public Notice, 23 FCC Rcd 4572 (WTB 2008).

⁹¹ *See Service Rules for the 746–764 MHz Bands, and Revisions to Part 27 of the Commission’s Rules*, Second Report and Order, 15 FCC Rcd 5299 (2000) (*746–764 MHz Band Second Report and Order*).

⁹² *See id.* at 5343, para. 108.

⁹³ *See id.*

⁹⁴ *See id.* at 5343, para. 108 n.246 (for the 746–764 MHz and 776–794 MHz bands, the Commission is exempt from 15 U.S.C. § 632, which requires Federal agencies to obtain SBA approval before adopting small business size standards).

⁹⁵ *See 700 MHz Guard Bands Auction Closes: Winning Bidders Announced*, Public Notice, 15 FCC Rcd 18026 (WTB 2000).

eight of the licenses auctioned were sold to three bidders. One of these bidders was a small business that won a total of two licenses.⁹⁶

32. *Air-Ground Radiotelephone Service.* The Commission has previously used the SBA's small business size standard applicable to Wireless Telecommunications Carriers (except Satellite), which is an entity employing no more than 1,500 persons.⁹⁷ For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year. Of this total, 955 firms had fewer than 1,000 employees and 12 had employment of 1000 employees or more.⁹⁸ There are approximately 100 licensees in the Air-Ground Radiotelephone Service, and we estimate that almost all of them qualify as small entities under the SBA definition. For purposes of assigning Air-Ground Radiotelephone Service licenses through competitive bidding, the Commission has defined "small business" as an entity that, together with controlling interests and affiliates, has average annual gross revenues for the preceding three years not exceeding \$40 million.⁹⁹ A "very small business" is defined as an entity that, together with controlling interests and affiliates, has average annual gross revenues for the preceding three years not exceeding \$15 million.¹⁰⁰ These definitions were approved by the SBA.¹⁰¹ In May 2006, the Commission completed an auction of nationwide commercial Air-Ground Radiotelephone Service licenses in the 800 MHz band (Auction No. 65). On June 2, 2006, the auction closed with two winning bidders winning two Air-Ground Radiotelephone Services licenses. Neither of the winning bidders claimed small business status.

33. *AWS Services (1710–1755 MHz and 2110–2155 MHz bands (AWS-1); 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz bands (AWS-2); 2155–2175 MHz band (AWS-3)).* For the AWS-1 bands,¹⁰² the Commission has defined a "small business" as an entity with average annual gross revenues for the preceding three years not exceeding \$40 million, and a "very small business" as an entity with average annual gross revenues for the preceding three years not exceeding \$15 million. For AWS-2 and AWS-3, although we do not know for certain which entities are likely to apply for these frequencies, we note that the AWS-1 bands are comparable to those used for cellular service and personal communications service. The Commission has not yet adopted size standards for the AWS-2 or AWS-3 bands but proposes to treat both AWS-2 and AWS-3 similarly to broadband PCS service and AWS-1 service due to the comparable capital requirements and other factors, such as issues involved in relocating incumbents and developing markets, technologies, and services.¹⁰³

⁹⁶ See *700 MHz Guard Bands Auction Closes: Winning Bidders Announced*, Public Notice, 16 FCC Rcd 4590 (WTB 2001).

⁹⁷ 13 CFR § 121.201, NAICS codes 517210.

⁹⁸ *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

⁹⁹ *Amendment of Part 22 of the Commission's Rules to Benefit the Consumers of Air-Ground Telecommunications Services, Biennial Regulatory Review—Amendment of Parts 1, 22, and 90 of the Commission's Rules, Amendment of Parts 1 and 22 of the Commission's Rules to Adopt Competitive Bidding Rules for Commercial and General Aviation Air-Ground Radiotelephone Service*, Order on Reconsideration and Report and Order, 20 FCC Rcd 19663, paras. 28-42 (2005).

¹⁰⁰ *Id.*

¹⁰¹ See Letter from Hector V. Barreto, Administrator, SBA, to Gary D. Michaels, Deputy Chief, Auctions and Spectrum Access Division, Wireless Telecommunications Bureau, Federal Communications Commission (filed Sept. 19, 2005).

¹⁰² The service is defined in section 90.1301 *et seq.* of the Commission's Rules, 47 CFR § 90.1301 *et seq.*

¹⁰³ See *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Report and Order, 18 FCC Rcd 25162, Appx. B (2003), *modified by Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Order on Reconsideration, 20 FCC Rcd 14058, Appx. C (2005); *Service Rules for Advanced Wireless Services in the 1915–1920 MHz, 1995–2000 MHz, 2020–2025 MHz and 2175–2180 MHz Bands; Service Rules for* (continued....)

34. *3650–3700 MHz band.* In March 2005, the Commission released a *Report and Order and Memorandum Opinion and Order* that provides for nationwide, non-exclusive licensing of terrestrial operations, utilizing contention-based technologies, in the 3650 MHz band (i.e., 3650–3700 MHz). As of April 2010, more than 1270 licenses have been granted and more than 7433 sites have been registered. The Commission has not developed a definition of small entities applicable to 3650–3700 MHz band nationwide, non-exclusive licensees. However, we estimate that the majority of these licensees are Internet Access Service Providers (ISPs) and that most of those licensees are small businesses.

35. *Fixed Microwave Services.* Microwave services include common carrier,¹⁰⁴ private-operational fixed,¹⁰⁵ and broadcast auxiliary radio services.¹⁰⁶ They also include the Local Multipoint Distribution Service (LMDS),¹⁰⁷ the Digital Electronic Message Service (DEMS),¹⁰⁸ and the 24 GHz Service,¹⁰⁹ where licensees can choose between common carrier and non-common carrier status.¹¹⁰ At present, there are approximately 36,708 common carrier fixed licensees and 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. There are approximately 135 LMDS licensees, three DEMS licensees, and three 24 GHz licensees. The Commission has not yet defined a small business with respect to microwave services. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite) and the appropriate size standard for this category under SBA rules is that such a business is small if it has 1,500 or fewer employees.¹¹¹ For this industry, U.S. Census data for 2012 show that there were 967 firms that operated for the entire year. Of this total, 955 firms had fewer than 1,000 employees and 12 had employment of 1000 employees or more.¹¹² Thus under this SBA category and the associated size standard, the Commission estimates that a majority of fixed microwave service licensees can be considered small.

36. The Commission does not have data specifying the number of these licensees that have more than 1,500 employees, and thus is unable at this time to estimate with greater precision the number of fixed microwave service licensees that would qualify as small business concerns under the SBA's small business size standard. Consequently, the Commission estimates that there are up to 36,708 common carrier fixed licensees and up to 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services that may be small and may be affected by the rules and policies adopted herein. We note, however, that the common carrier microwave fixed licensee category does include some large entities.

(Continued from previous page)

Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, Notice of Proposed Rulemaking, 19 FCC Rcd 19263, Appx. B (2005); *Service Rules for Advanced Wireless Services in the 2155–2175 MHz Band*, Notice of Proposed Rulemaking, 22 FCC Rcd 17035, Appx. (2007).

¹⁰⁴ See 47 CFR Part 101, Subparts C and I.

¹⁰⁵ See 47 CFR Part 101, Subparts C and H.

¹⁰⁶ Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. See 47 CFR Part 74. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

¹⁰⁷ See 47 CFR Part 101, Subpart L.

¹⁰⁸ See 47 CFR Part 101, Subpart G.

¹⁰⁹ See *id.*

¹¹⁰ See 47 CFR §§ 101.533, 101.1017.

¹¹¹ See 13 CFR § 121.201, NAICS code 517210.

¹¹² *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

37. *Broadband Radio Service and Educational Broadband Service.* Broadband Radio Service systems, previously referred to as Multipoint Distribution Service (MDS) and Multichannel Multipoint Distribution Service (MMDS) systems, and “wireless cable,” transmit video programming to subscribers and provide two-way high speed data operations using the microwave frequencies of the Broadband Radio Service (BRS) and Educational Broadband Service (EBS) (previously referred to as the Instructional Television Fixed Service (ITFS)).¹¹³

38. *BRS* - In connection with the 1996 BRS auction, the Commission established a small business size standard as an entity that had annual average gross revenues of no more than \$40 million in the previous three calendar years.¹¹⁴ The BRS auctions resulted in 67 successful bidders obtaining licensing opportunities for 493 Basic Trading Areas (BTAs). Of the 67 auction winners, 61 met the definition of a small business. BRS also includes licensees of stations authorized prior to the auction. At this time, we estimate that of the 61 small business BRS auction winners, 48 remain small business licensees. In addition to the 48 small businesses that hold BTA authorizations, there are approximately 392 incumbent BRS licensees that are considered small entities.¹¹⁵ After adding the number of small business auction licensees to the number of incumbent licensees not already counted, we find that there are currently approximately 440 BRS licensees that are defined as small businesses under either the SBA or the Commission’s rules.

39. In 2009, the Commission conducted Auction 86, the sale of 78 licenses in the BRS areas.¹¹⁶ The Commission offered three levels of bidding credits: (i) a bidder with attributed average annual gross revenues that exceed \$15 million and do not exceed \$40 million for the preceding three years (small business) received a 15 percent discount on its winning bid; (ii) a bidder with attributed average annual gross revenues that exceed \$3 million and do not exceed \$15 million for the preceding three years (very small business) received a 25 percent discount on its winning bid; and (iii) a bidder with attributed average annual gross revenues that do not exceed \$3 million for the preceding three years (entrepreneur) received a 35 percent discount on its winning bid.¹¹⁷ Auction 86 concluded in 2009 with the sale of 61 licenses.¹¹⁸ Of the ten winning bidders, two bidders that claimed small business status won 4 licenses; one bidder that claimed very small business status won three licenses; and two bidders that claimed entrepreneur status won six licenses.

40. *EBS* - The SBA’s Cable Television Distribution Services small business size standard is applicable to EBS. There are presently 2,436 EBS licensees. All but 100 of these licenses are held by educational institutions. Educational institutions are included in this analysis as small entities.¹¹⁹ Thus,

¹¹³ *Amendment of Parts 21 and 74 of the Commission’s Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, Report and Order, 10 FCC Rcd 9589, 9593, para. 7 (1995).

¹¹⁴ 47 CFR § 21.961(b)(1).

¹¹⁵ 47 U.S.C. § 309(j). Hundreds of stations were licensed to incumbent MDS licensees prior to implementation of Section 309(j) of the Communications Act of 1934, 47 U.S.C. § 309(j). For these pre-auction licenses, the applicable standard is SBA’s small business size standard of 1500 or fewer employees.

¹¹⁶ *Auction of Broadband Radio Service (BRS) Licenses, Scheduled for October 27, 2009, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 86*, Public Notice, 24 FCC Rcd 8277 (2009).

¹¹⁷ *Id.* at 8296 para. 73.

¹¹⁸ *Auction of Broadband Radio Service Licenses Closes, Winning Bidders Announced for Auction 86, Down Payments Due November 23, 2009, Final Payments Due December 8, 2009, Ten-Day Petition to Deny Period*, Public Notice, 24 FCC Rcd 13572 (2009).

¹¹⁹ The term “small entity” within SBREFA applies to small organizations (nonprofits) and to small governmental jurisdictions (cities, counties, towns, townships, villages, school districts, and special districts with populations of less than 50,000). 5 U.S.C. §§ 601(4)-(6). We do not collect annual revenue data on EBS licensees.

we estimate that at least 2,336 licensees are small businesses. Since 2007, Cable Television Distribution Services have been defined within the broad economic census category of Wired Telecommunications Carriers. Wired Telecommunications Carriers are comprised of establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies.”¹²⁰ The SBA’s small business size standard for this category is all such firms having 1,500 or fewer employees.¹²¹ U.S. Census data for 2012 show that there were 3,117 firms that operated that year. Of this total, 3,083 operated with fewer than 1,000 employees. Thus, under this size standard, the majority of firms in this industry can be considered small.

5. Satellite Service Providers

41. *Satellite Telecommunications.* This category comprises firms “primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.”¹²² The category has a small business size standard of \$32.5 million or less in average annual receipts, under SBA rules.¹²³ For this category, U.S. Census Bureau data for 2012 show that there were a total of 333 firms that operated for the entire year.¹²⁴ Of this total, 299 firms had annual receipts of less than \$25 million.¹²⁵ Consequently, we estimate that the majority of satellite telecommunications providers are small entities.

42. *All Other Telecommunications.* The “All Other Telecommunications” category is comprised of establishments that are primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.¹²⁶ The SBA has developed a small business size standard for “All Other Telecommunications,” which consists of all such firms with gross annual receipts of \$32.5 million or less.¹²⁷ For this category, U.S. Census data for 2012 show that there were 1,442 firms that operated for

¹²⁰ U.S. Census Bureau, *2017 NAICS Definitions*, “517311 Wired Telecommunications Carriers,” (partial definition), <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

¹²¹ See, 13 CFR § 121.201. The Wired Telecommunications Carrier category formerly used the NAICS code of 517110. As of 2017 the U.S. Census Bureau definition shows the NAICS code as 517311 for Wired Telecommunications Carriers. See, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

¹²² U.S. Census Bureau, *2012 NAICS Definitions*, “517410 Satellite Telecommunications”; <http://www.census.gov/naics/2007/def/ND517410.HTM>.

¹²³ 13 CFR § 121.201, NAICS code 517410.

¹²⁴ U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012, NAICS code 517410 http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ4&prodTtype=table.

¹²⁵ *Id.*

¹²⁶ U.S. Census Bureau, Estb & Firm Size: Receipts Size of Firms for the U.S. 2012, <http://www.census.gov/cgi-bin/sssd/naics/naicsrch>.

¹²⁷ 13 CFR § 121.201; NAICS Code 517919.

the entire year. Of these firms, a total of 1,400 had gross annual receipts of less than \$25 million.¹²⁸ Consequently, a majority of “All Other Telecommunications” firms potentially affected by our action can be considered small.

6. Cable Service Providers

43. *Cable and Other Subscription Programming.* This industry comprises establishments primarily engaged in operating studios and facilities for the broadcasting of programs on a subscription or fee basis. The broadcast programming is typically narrowcast in nature (e.g. limited format, such as news, sports, education, or youth-oriented). These establishments produce programming in their own facilities or acquire programming from external sources. The programming material is usually delivered to a third party, such as cable systems or direct-to-home satellite systems, for transmission to viewers.¹²⁹ The SBA has established a size standard for this industry stating that a business in this industry is small if it has 1,500 or fewer employees.¹³⁰ The 2012 Economic Census indicates that 367 firms were operational for that entire year. Of this total, 357 operated with less than 1,000 employees.¹³¹ Accordingly we conclude that a substantial majority of firms in this industry are small under the applicable SBA size standard.

44. *Cable Companies and Systems (Rate Regulation).* The Commission has developed its own small business size standards for the purpose of cable rate regulation. Under the Commission's rules, a “small cable company” is one serving 400,000 or fewer subscribers nationwide.¹³² Industry data indicate that there are currently 4,600 active cable systems in the United States.¹³³ Of this total, all but eleven cable operators nationwide are small under the 400,000-subscriber size standard.¹³⁴ In addition, under the Commission's rate regulation rules, a “small system” is a cable system serving 15,000 or fewer subscribers.¹³⁵ Current Commission records show 4,600 cable systems nationwide. Of this total, 3,900 cable systems have fewer than 15,000 subscribers, and 700 systems have 15,000 or more subscribers, based on the same records.¹³⁶ Thus, under this standard as well, we estimate that most cable systems are small entities.

45. *Cable System Operators (Telecom Act Standard).* The Communications Act of 1934, as amended, also contains a size standard for small cable system operators, which is “a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed \$250,000,000.”¹³⁷ There are approximately 52,403,705 cable video subscribers in the United States today.¹³⁸ Accordingly, an operator serving fewer than 524,037 subscribers shall be deemed a small operator if its annual revenues, when combined with the total annual revenues of all its affiliates, do not

¹²⁸ http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ4&prodType=table.

¹²⁹ <https://www.census.gov/agi-bin/ssd/naics/naicsrch>.

¹³⁰ 13 CFR § 121.201, 2016 NAICS Code 515210.

¹³¹ http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2012_US_51SSSZ5&prodType=table.

¹³² 47 CFR § 76.901(e).

¹³³ August 15, 2015 Report from the Media Bureau based on data contained in the Commission's Cable Operations and Licensing System (COALS). See www.fcc.gov/coals.

¹³⁴ Data obtained from SNL Kagan data base on April 19, 2017.

¹³⁵ 47 CFR § 76.901(c).

¹³⁶ August 5, 2015 report from the Media Bureau based on its research in COALS. See www.fcc.gov/coals.

¹³⁷ 47 CFR § 76.90(f) and notes ff. 1, 2, and 3.

¹³⁸ See SNL KAGAN at <http://www.snl.com/interactivex/MultichannelIndustryBenchmarks.aspx>.

exceed \$250 million in the aggregate.¹³⁹ Based on available data, we find that all but nine incumbent cable operators are small entities under this size standard.¹⁴⁰ We note that the Commission neither requests nor collects information on whether cable system operators are affiliated with entities whose gross annual revenues exceed \$250 million.¹⁴¹ Although it seems certain that some of these cable system operators are affiliated with entities whose gross annual revenues exceed \$250 million, we are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

7. All Other Telecommunications

46. *Electric Power Generators, Transmitters, and Distributors.* This U.S. industry is comprised of establishments that are primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.¹⁴² The closest applicable SBA category is “All Other Telecommunications”. The SBA’s small business size standard for “All Other Telecommunications,” consists of all such firms with gross annual receipts of \$32.5 million or less.¹⁴³ For this category, U.S. Census data for 2012 show that there were 1,442 firms that operated for the entire year. Of these firms, a total of 1,400 had gross annual receipts of less than \$25 million.¹⁴⁴ Consequently, we estimate that under this category and the associated size standard the majority of these firms can be considered small entities.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

47. The potential modifications proposed in this *FNPRM* if adopted, could, at least initially, impose some new reporting, recordkeeping, or other compliance requirements on some small entities. In order to evaluate any new or modified reporting, recordkeeping, or other compliance requirements that may result from the actions proposed in this *FNPRM*, the Commission has sought input from the parties on various matters. As indicated above, the *FNPRM* seeks comment on modifications to the Commission’s existing Form 477 to minimize burdens on carriers while enhancing the utility of the data the Commission collects. The proposals include removing some previous Form 477 reporting requirements, altering some existing requirements, and supplementing the Form 477 collection with some additional, directed proposals to improve the data collected. For example, we propose to remove some requirements that do not appear to provide salient data, but we also propose collecting new or different data to ensure the data capture the most relevant new advances in service offerings and availability. Nevertheless, we anticipate that the removal or modification of some Form 477 reporting requirements will lead to a long-term reduction in reporting, recordkeeping, or other compliance requirements on some small entities.

¹³⁹ 47 CFR § 76.901(f) and notes ff. 1, 2, and 3.

¹⁴⁰ See SNL KAGAN at http://www.snl.com/interactivex/TopCable_MSOs.aspx.

¹⁴¹ The Commission does receive such information on a case-by-case basis if a cable operator appeals a local franchise authority’s finding that the operator does not qualify as a small cable operator pursuant to section 76.901(f) of the Commission’s rules. See 47 CFR § 76.901(f).

¹⁴² <http://www.census.gov/cgi-bin/sssd/naics/naicsrch>.

¹⁴³ 13 CFR § 121.201; NAICS Code 517919.

¹⁴⁴ U.S. Census Bureau, Estb & Firm Size: Receipts Size of Firms for the U.S., 2012 http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?_af=ECN_2012_US_51SSSZ4&prodType=table.

E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

48. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include (among others) the following four alternatives: (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.¹⁴⁵

49. To evaluate options and alternatives should there be a significant economic impact on small entities as a result of actions that have been proposed in this *FNPRM*, the Commission has sought comment from the parties. The *FNPRM* seeks comment on ways in which the Commission might streamline its current requirements and thereby reduce the burdens on small providers and other filers. We also seek comment on ways in which we might improve the usefulness of other aspects of the Form 477 to maximize the utility of the information we continue to collect.¹⁴⁶ For example, we ask whether we need to collect mobile voice deployment data by technology and spectrum band, and whether we should revise mobile voice deployment reporting requirements to allow a simple check instead of detailed information for some existing voice deployment reporting requirements.¹⁴⁷ Steps such as these seek to reduce the types and amount of information we collect, which results in more useful information, and also reduces burdens placed on small entities and others. In addition, other proposals we outline could, for example, limit the number of shapefiles (and the amount of the associated underlying data processing) providers are required to submit.¹⁴⁸

50. The Commission expects to more fully consider the economic impact on small entities following its review of comments filed in response to the *FNPRM* and this IRFA. In particular, we seek comment herein on the effect the various proposals described in the *FNPRM*, and summarized above, will have on small entities, and on what effect alternative Form 477 reporting requirements would have on those entities. We also seek comment from interested parties on any potential additional methods of reducing compliance burdens for small providers and ensuring the most useful information based on the Form 477 collection. Our evaluation of the comments filed on these topics as well as on other proposals and questions in the *FNPRM* that seek to reduce the burdens placed on small providers in both the mobile and fixed contexts will shape the final conclusions we reach, the final significant alternatives we consider, and the actions we ultimately take in this proceeding to minimize any significant economic impact that may occur on small entities.

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

51. None.

¹⁴⁵ 5 U.S.C. § 603(c)(1)-(4).

¹⁴⁶ See *FNPRM* Part.III.

¹⁴⁷ See *FNPRM* Part III.A.2.

¹⁴⁸ See *FNPRM* Part III.A.3.

**STATEMENT OF
CHAIRMAN AJIT PAI**

Re: *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10

Sherlock Holmes once said, “It is a capital mistake to theorize before one has data.”¹ Holmes was famous for quickly drawing advanced deductions and conclusions from just a dribble of data. But inevitably, as the story went on, Holmes would find new clues and acquire new data, which would ultimately lead him to update his theories and solve the mystery. Of course, Sherlock’s success hinged on the data being accurate—a meaningful representation of reality.

With this *Further Notice*, we aim to make sure our Form 477 data is as accurate as possible. Form 477 generates one of our most important data sets at the Commission, one we rely on every day. And the interest in Form 477 seems strong. In the two congressional hearings in which I participated last month, Form 477 was mentioned by name a total of nine times. That’s a pretty well-known dataset.

Maintaining updated and accurate data about broadband deployment is critical to bridging the digital divide. It lets us target our efforts to those areas that most need it. And it allows us to measure our progress in bringing digital opportunity to all Americans.

But we’ve heard concerns about the quality of the Form 477 data we’ve been collecting. That’s why, earlier today, we instituted a special, one-time data collection for purposes of the Mobility Fund Phase II reverse auction. We wanted to make sure that for that auction, we were drawing on the correct data.

Going forward, we want to make sure that overall Form 477 is giving us the right snapshot of where connectivity is and where it isn’t. So we’re teeing up ideas for collecting more granular and standardized data.

At the same time, we want to make sure we only collect what we need. So in this *Further Notice*, we also explore whether there are parts of Form 477 for which the burdens of collection outweigh the benefits. This is just good housekeeping. Data collections that pile up for little reason other than inertia disserve the agency in its decision-making. And every dollar we make providers—whether big or small—spend filing data that we don’t need is a dollar they can’t devote to connecting Americans.

Thank you to the staff that worked on this item. From the Wireline Competition Bureau: Kirk Burgee, Ellen Burton, Joseph Calascione, James Eisner, Chelsea Fallon, Ken Lynch, Virginia Metallo, Thom Parisi, Eric Ralph, Steve Rosenberg, Shane Taylor, Rodger Woock, Suzanne Yelen, and David Zesiger; from the Wireless Telecommunications Bureau: Judith Dempsey, Ben Freeman, Catherine Matraves, Jennifer Salhus, Paroma Sanyal, Ziad Sleem, Patrick Sun, Tom Tran, Matt Warner, and Joseph Wyer; from the International Bureau: Jose Albuquerque, Denise Coca, Jerry Duvall, Chip Fleming, Francis Gutierrez, Gabrielle Kim, Kerry Murray, Jim Schlichting, Daniel Shiman, Walt Strack, Troy Tanner, Irene Wu, and Michele Wu-Bailey; from the Office of General Counsel: Bill Dever, Rick Mallen, Keith McCrickard, and Joel Rabinovitz; from the Office of Strategic Planning and Policy Analysis: Paul LaFontaine, Wayne Leighton, and Henning Schulzrinne; and from the Office of Communication Business Opportunities: Maura McGowan, Chana Wilkerson, and Sanford Williams.

In *The Adventure of the Copper Beaches*, Sherlock Holmes cried out impatiently, “Data!, Data!, Data! I can’t make bricks without clay.” Thanks to your work, the Commission will soon have better clay to use in constructing its policies.

¹ Arthur Conan Doyle, *The Adventures of Sherlock Holmes, A Scandal in Bohemia* (1892).

**STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN**

Re: *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10

A visit to the National Broadband Map's website, would lead an observer to conclude that all parts of Alexandria, Virginia have a choice between two fixed providers both providing over 10 Mbps service in their residential communities. Yet, the evidence suggests that this is far from accurate. That same map also reports, that there is a provider offering residential gigabit service to some parts of that city. Once again, those promises of service offerings, do not equal the reality of today. And to top it off, the dataset containing these faulty conclusions . . . has not been updated for more than two years.

In short, the Commission's data on broadband availability, does not accurately reflect the realities on the ground. Now, I have heard from consumers, small businesses, state and local government officials, Tribal leaders, and members of Congress, who have expressed significant frustration with the accuracy of our broadband coverage data. Indeed, just last month I heard from frustrated county commissioners and consumers in Appalachia who told me that despite "what those maps in Washington say, we are not connected." So, I am pleased to be able to say, that this item contains my request to seek comment on rectifying that problem by feeding more granular Form 477 data into the National Broadband Map. For the past year, I have spoken repeatedly about the need to update Form 477, in addition to reinvigorating the National Broadband Map. Now is the time to do so.

We updated our Form 477 data collection, while I was Acting Chair, in order to make it easier on industry and more effective for the Commission by giving us the data we need, to craft sound policy. Today, we iterate on that by seeking comment on how to further improve Form 477, to better enable policy and serve the American consumer. We seek comment on how to improve the accuracy of mobile and fixed broadband data, as well as potential ways to streamline and improve data collection.

I am hopeful that these efforts, will provide the means to make more granular data available to the public, while remaining cognizant of both Commission and provider resources. By proposing to make minimum advertised mobile broadband speeds, national subscriber counts, and other disaggregated broadband data available to consumers, we take several positive steps forward. New data, if made publicly available, could be used in innovative ways to provide immense public benefits, such as to improve our Connect2Health Map. It could also be fed into mapping initiatives across this nation, to improve education, health, and public safety. The opportunities are endless, if we collect the necessary data, have accurate data, and use that data in the right way.

My thanks to the Wireline Competition Bureau and the Wireless Telecommunications Bureau, and others, for your work to improve the data collection process, because we base so many of our significant policy decisions, on the information we receive from those filers. With more accurate data, we will be able to better target underserved and unserved communities and ensure that the rich benefits of broadband, reach all Americans.

**STATEMENT OF
COMMISSIONER MICHAEL O'RIELLY**

Re: *Modernizing the FCC Form 477 Data Program, WC Docket No. 11-10*

I support this Further Notice, which seeks to improve the Form 477 data collection. As the item notes, the Commission uses broadband deployment data collected through Form 477 to inform its policymaking. However, the data collection is often criticized for not being sufficiently accurate or reliable. Part of the challenge is that Form 477 has been used inside and outside of the Commission for distinct purposes and the data collected for one purpose might not be well suited to another.

The Commission has addressed this over time on an ad hoc basis. For example, the Commission has refined Form 477 data through challenge processes that can consume substantial staff resources but have been necessary to ensure that scarce universal service funds are targeted to truly eligible areas. Alternatively, when the data have been deemed inadequate enough for a particular purpose, as is the case with the Mobility Fund Phase II item we just voted, the Commission must conduct a separate, one-time data collection.

Therefore, as we embark on this proceeding to reform the Form 477 data collection, it is important to step back and think about our goals for this collection. Specifically, we need to be able to articulate how we expect the data to be used so that any revised collection is calibrated to meet the intended purposes. Without this examination, the Commission could unwittingly continue to over-collect some data and under-collect other data. I found the discussion to be somewhat lacking in the circulated version, so I am pleased that it has been revised to elicit a more fulsome record.

Finally, I want to make the point that more data doesn't necessarily mean better data. If there are parts of the collection that the Commission and outside parties no longer use, then we should discontinue them. Likewise, before imposing new requirements or more granular reporting, we should carefully consider the costs and benefits. Additionally, if we can meet our data needs and policy obligations through less frequent reporting, particularly from already overburdened small providers, then we should provide any necessary relief.

I will vote to approve.